December 31, 2014

Mr. James M. DiLorenzo
Remedial Project Manager
United States Environmental Protection Agency
Office of Site Remediation and Restoration
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Mail code: OSRR07-4
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Subject: Semi-Annual Status Report No. 15
April 2014 to September 2014
Olin Chemical Superfund Site
Wilmington, Massachusetts

Dear Mr. DiLorenzo:

On behalf of Olin Corporation, enclosed please find 7 hard copies and 10 electronic copies of the document titled*" Semi-Annual Status Report No. 15, Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts".* A separate electronic copy is being submitted to Joseph Coyne of the Massachusetts Department of Environmental Protection. This report is being submitted in accordance with the requirements specified in Sections 1.III.E and 2.II.C of the Final Statement of Work (SOW) for the Olin Chemical Superfund Site. The SOW is incorporated by reference into the Administrative Settlement Agreement and Order of Consent for Remedial Investigation and Feasibility Study for the Olin Chemical Superfund Site, Wilmington, Massachusetts (USEPA CERCLA Docket No. 01-2007-0102).

This document was prepared for the sole use of Olin Corporation and the United States Environmental Protection Agency, the only intended beneficiaries of our work. No other party shall rely on the information contained herein without prior written consent of AMEC Environment & Infrastructure, Inc.

If you have any questions concerning this deliverable, please do not hesitate to contact Mr. James Cashwell, Olin Corporation, at 423-336-4012.

Sincerely,

AMEC Environment & Infrastructure, Inc

Peter H. Thompson
Project Manager

Michael J. Murphy
Project Principal

cc: AMEC Project File
J. Cashwell, Olin (1)
Joseph Coyne, MassDEP (1)

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SEMS Doc ID 650708

SEMI-ANNUAL STATUS REPORT NO. 15

OLIN CHEMICAL SUPERFUND SITE

51 EAMES STREET
WILMINGTON, MASSACHUSETTS

Submitted to:

United States Environmental Protection Agency
Office of Site Remediation and Restoration
5 Post Office Square, Suite 100
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Submitted by:

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Project No. 6107140016.04

December 31, 2014

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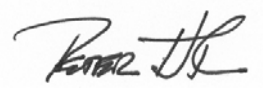

Peter H. Thompson
Project Manager

Michael J. Murphy
Project Principal

Disclaimer: This Report is intended for the exclusive use and benefit of, and may be relied upon only by, Olin Corporation, its successors and USEPA.

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GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
BEHP	Bis(2-ethylhexyl)phthalate
CSL	Calcium Sulfate Landfill
DAPL	Dense Aqueous Phase Liquid
DMF	Dimethylformamide
EE/CA	Engineering Evaluation/Cost Analysis
EPH	Extractable Petroleum Hydrocarbons
IRS	Interim Response Steps
IRSWP	Interim Response Steps Work Plan
ISCO	In-situ Chemical Oxidation
LNAPL	Light Non-aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
MassDEP	Massachusetts Department of Environmental Protection
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSA	Method of Standard Additions
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
NDMA	N-nitrosodimethylamine
NDPhA	N-nitrosodiphenylamine
NDPrA	N-nitroso di-n-propylamine
Olin	Olin Corporation
off-PWD	off-Property West Ditch
OU	Operable Unit
QA/QC	Quality Assurance/Quality Control
RAE	Remedial Alternatives Evaluation
RGP	Remediation General Permit
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
SASR	Semi-Annual Status Report
Site	Olin Chemical Superfund Site
SVOC	Semi-Volatile Organic Compound
TAL	TestAmerica Laboratories, Inc.
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
VPH	Volatile Petroleum Hydrocarbon

1.0 INTRODUCTION

This Semi-Annual Status Report (SASR) has been prepared for the Olin Chemical Superfund Site (the Site) in Wilmington, Massachusetts, on behalf of Olin Corporation (Olin) by AMEC Environment & Infrastructure, Inc. (AMEC). The SASR has been prepared consistent with Section 2.II.C. of the Statement of Work, Remedial Investigation/Feasibility Study (RI/FS), Olin Chemical Superfund Site, prepared by the United States Environmental Protection Agency (USEPA) Region I – New England and dated June 2007 (USEPA, 2007). This SASR summarizes the monitoring activities conducted from April 2014 through September 2014 and presents monitoring data and analytical results including, but not limited to, groundwater and surface water data from the Slurry Wall/Cap and Plant B monitoring programs for the second and third quarter of 2014.

The Site location is presented in **Figure 1-1**. **Figure 1-2** is a Site plan that identifies the three areas that are described in the Interim Response Steps Work Plan (IRSWP) including Slurry Wall/Cap Containment Area, Plant B, and the off-Property West Ditch (OPWD) area. This SASR discusses field and design/construction activities for those three areas which are ongoing Interim Response Steps (IRS) as described in the IRSWP.

The three specific IRSs include:

- Slurry Wall/Cap – monitoring of groundwater, surface water, and sediment in the area surrounding the Slurry Wall and inspection of the temporary cap;
- Plant B – operation, maintenance, and monitoring of the groundwater recovery/treatment system that was designed to remove and control migration of light non-aqueous phase liquid (LNAPL); and
- Dense Aqueous Phase Liquid (DAPL) Extraction Pilot Test – design, installation and operation of a pilot study to evaluate the efficacy of DAPL extraction in the OPWD Area.

This SASR is organized as follows:

Section 1.0 – Introduction
Section 2.0 – Slurry Wall/Cap
Section 3.0 – Plant B
Section 4.0 – DAPL Extraction Pilot Test Design
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Appendix C – Weir Monthly Inspection Reports: April 2014 – September 2014

Appendix D – Slurry Wall/Cap Groundwater and Surface Water Time Series Plots
- D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
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Appendix E – Slurry Wall/Cap Data Logger Water Level Plots

2.0 SLURRY WALL/CAP

The following sections present results of chemical analyses for groundwater and surface water samples associated with the slurry wall/cap during the second and third quarter of 2014. Groundwater level data for the second and third quarter of 2014 are presented in the field activity reports contained in **Appendices A-1 and A-2**. The data validation reports for the second and third quarter 2014 sampling events are provided in **Appendices B-1 and B-2**, respectively. The results of these analyses are generally consistent with past results.

Olin personnel conducted weekly observations of the weir and South Ditch and recorded observations concerning wildlife, surface water conditions, and flocculent accumulation. These reports are reviewed by AMEC and compiled in separate monthly reports, which are provided for the current reporting period in **Appendix C**.

2.1 Groundwater

Groundwater sampling and analysis for the second quarter 2014 Slurry Wall/Cap sampling event was completed from May 19th through the 27th, 2014. The third quarter 2014 sampling event was completed on August 19th through the 21st, 2014.

The second quarter 2014 sampling event included groundwater sample collection from 14 monitoring wells: GW-10S, GW-24, GW-25, GW-34SR, GW-34D, GW-35S, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA-1; and five piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25 located along the South Ditch consistent with the Final IRSWP. The third quarter 2014 sampling event included groundwater sample collection from five monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and five piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25.

Quality Assurance/Quality Control (QA/QC) samples include two field duplicates and two matrix spike/matrix spike duplicates (MS/MSD).

The sample locations, details of sampling, and the analytical program are identified in the field activity reports. Field activity reports for the second and third quarter 2014 sampling events are contained in **Appendices A-1 and A-2**, respectively. The field activity reports also contain tabulated final field parameter measurements collected at the time of sampling, sample collection field data records, and instrument calibration records. Groundwater samples are analyzed by the laboratory for ammonia, chloride, sulfate, specific conductance and filtered samples are analyzed for aluminum and chromium.

Table 2-1 and Table 2-2 summarize groundwater analytical results for samples collected during the second and third quarter 2014 sampling events. The second and third quarter 2014 data validation memoranda for groundwater and surface water are included in **Appendices B-1 and B-2** and conclude that TestAmerica Laboratories, Inc. (TAL) results are useable as reported by the laboratory unless otherwise indicated in the validation report. Validation actions included

qualification of some laboratory values for ammonia in May, as estimated (J), due to comparison of matrix spike / matrix spike duplicate (percent recovery) and field duplicate (relative percent difference) results. In addition, sulfate results for locations GW-202D DUP and GW-202S, were qualified as estimated (J) due to results having exceeded instrument calibration range.

Appendix D-1 presents time series groundwater concentration plots for aluminum, ammonia, chloride, chromium, specific conductance, and sulfate from the south, southeast, west, and north areas surrounding the Containment Area. These plots include historic data along with data from the second and third quarter 2014 sampling events. Groundwater analytical data for monitoring well GW-43SR (west of the Containment Area) and piezometers PZ-24 and PZ-25 (south of the Containment Area) have been added to **Appendix D**. Two wells (PZ-24 and GW-35S) identified on these plots are interior to the Containment Area, while one well (GW-CA1) is located within the gravel equalization window.

The analytical results for dissolved metals (aluminum and chromium) in groundwater samples collected from south of the Containment Area (GW-78S, GW-202S, GW-202D, PZ-17RRR, PZ-18R, PZ-24, PZ-25), southeast of the Containment Area (GW-79S, GW-201S, PZ-16RR), west of the Containment Area (GW-24, GW-25, GW-26, GW-42S, GW-43SR, GW-76S), and north of the Containment Area (GW-34D, GW-34SR, GW-35S, GW-CA1) are consistent with historical data and are within historical ranges (**Appendix D-1, Figures D-1.1 through D-1.8**). Groundwater concentrations of dissolved aluminum and dissolved chromium increased for one sampling period at GW-202S (**Figures D-1.1 and D-1.5**). Groundwater concentrations of dissolved aluminum also increased slightly at GW-43SR (**Figure D-1.3**). Dissolved aluminum and dissolved chromium concentrations in groundwater from GW-202D and dissolved aluminum concentration from GW-10S continue to fluctuate but remain within the range of historical results (**Figures D-1.1, D-1.5 and D-1.4**).

The analytical results for ammonia in groundwater samples are consistent with historical data and are within historical ranges (**Figures D-1.9 through D-1.12**) with the exception that ammonia was not detected at GW-202D in the August event. Otherwise, concentrations of ammonia in groundwater samples from locations GW-202D and PZ-18R continue to fluctuate (**Figure D-1.9**) within range of historical results. The non-detect result for ammonia in GW-202D from August 2014 appears to be an anomaly.

Concentrations of chloride, sulfate, and specific conductivity are consistent with historical data and are within historical ranges (**Figures D-1.13 through D-1.24**). Concentrations of chloride, sulfate, and specific conductivity in groundwater samples from GW-202D and PZ-18R continue to fluctuate in a manner consistent with the other analytes (**Figures D-1.13, D-1.17, and D-1.21**). The chloride concentrations increased at locations GW-43SR and GW-76S above historical maximums in one sampling event as indicated on **Figures D-1.15**. These recent increases in chloride may reflect contribution from de-icing road salts from the parking lots of the adjacent buildings.

Groundwater levels were collected from select groundwater monitoring wells and piezometers prior to each sampling event. Water level measurements are tabulated in **Appendices A-1 and**

A-2. These measurements and the interpreted groundwater potentiometric surfaces are depicted on **Figures 2-1 and 2-2**. The water levels and interpreted groundwater potentiometric surface for the second and third quarter of 2014 are consistent with prior periods.

2.2 Surface Water

The second and third quarter 2014 Surry Wall/Cap sampling events include the collection of surface water samples from seven locations: ISCO-1, ISCO-2, ISCO-3, PZ-16RR, PZ-17RRR, PZ-18R, and SD-17. Unfiltered samples are analyzed by TAL for aluminum, chromium, sodium, ammonia, chloride, nitrate, nitrite, sulfate, and specific conductance. In addition, filtered surface water samples are analyzed for metals: aluminum, chromium, and sodium. QA/QC samples include one field duplicate and one MS/MSD. The sample locations, details of sampling, and the analytical program are identified in the field activity reports in **Appendices A-1 and A-2**.

Table 2-3 and Table 2-4 summarize surface water analytical results for samples collected during the second and third quarter 2014 sampling events. The surface water data validation memos are included in **Appendices B-1 and B-2** and conclude that TAL's results are useable as reported by the laboratory unless otherwise indicated in the validation report. In August, the results for sodium at ISCO-3 were qualified as estimated (J) due to dissolved fraction being 10% higher than the total fraction. Ammonia at ISCO-3 was qualified as not-detected at an action level of 0.5 mg/L (U) due to ammonia being reported in the laboratory method blank at a concentration of 0.113 mg/L.

Appendix D-2 presents time series surface water concentration plots for dissolved aluminum, dissolved chromium, ammonia, chloride, and sulfate from the Upper South Ditch and Lower South Ditch areas. These plots include historic data along with data from the second and third quarter 2014 sampling events.

Detected concentrations and temporal patterns of the metals and inorganic parameters are consistent and within historical ranges from samples collected in the Upper South Ditch and Lower South Ditch. Dissolved aluminum, dissolved chromium, and ammonia in surface water from the Upper South Ditch and Lower South Ditch are within historical ranges. Locations ISCO-2 and SD-17 previously had dissolved aluminum and chromium levels higher than historic results; however, recent results are within historical ranges (**Figures D-2.1 through D-2.6)**. Chloride, sulfate, and specific conductance concentrations in surface water samples are also within historical ranges in the Upper South Ditch and Lower South Ditch (**Figures D-2.7 through D-2.12)**.

2.3 Data Logger Data

Data loggers are deployed in 10 monitoring wells: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, GW-6S, PZ-24, and PZ-25, to continuously monitor groundwater elevation within and outside the Containment Area. **Appendix E** presents time series groundwater elevation plots (**Figure E-1 and Figure E-2**) compared to precipitation data measured at the Site. These plots include groundwater elevations from April 2014 through

September 2014 and have been corrected for barometric pressure using Site specific barometric pressure data. The data acquisition rate remains one reading every hour.

Continuous water level data plots indicate groundwater within and outside of the Containment Area responds to recharge of the aquifer. Comparison of water levels in GW-35S and GW-CA1 indicates oscillating periods of inward and outward groundwater flow gradients through the equalization window from April 2014 through September 2014, with outflows dominating from April through mid-July and inflows from mid-July through the end of September.

2.4 Temporary Cap Inspections

Inspections of the temporary cap were conducted on May 22, 2014 and August 26, 2014 as part of the second and third quarter 2014 sampling events. Full descriptions of the temporary cap inspections, including observations and necessary repairs completed on the temporary cap, are included in the field activity reports attached in **Appendix A**.

3.0 PLANT B

The following sections present results of chemical analysis of groundwater for the second and third quarter 2014 Plant B sampling events. Groundwater level data for the second and third quarter 2014 sampling events are presented in field activity reports contained in **Appendices A-1 and A-2**. The data validation reports for the second and third quarter of 2014 are provided in **Appendices B-1 and B-2,** respectively.

Olin personnel collected monthly water level, LNAPL thickness, LNAPL recovery data, and sampled the treatment plant influent and effluent in accordance with the Remediation General Permit (RGP) requirements. Samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, hexavalent chromium, chloroform, total phenols, residual chlorine, total suspended solids (TSS), chloride, and pH. The analytical program for the RGP was described in the IRSWP (MACTEC, 2008). The analytical data for the RGP are retained on-Property by Olin in accordance with that permit. Plant B sampling frequencies continue on a monthly basis. Since November 2013, an ion exchange system has been used at Plant B to remove arsenic from the treated Plant B effluent. Treated groundwater is stored in on-Site frac tanks and effluent sampling is completed from the frac tanks prior to discharge. A summary table of Plant B influent, effluent, and frac tank effluent data is presented in **Table 3-1**. The monthly water level and LNAPL thickness data (April 2014 – September 2014) are summarized in **Tables 3-4 and 3-5** and **Figures 3-1 through 3-12**.

East Ditch observations are made from the embankment on a daily basis during normal working days by the Olin staff that operates Plant B. The Plant B Water Treatment Plant Daily Report contains a check box for observation of LNAPL related sheens in the East Ditch. This check box is used if a sheen is observed. The daily report is an internal Plant B record of operating parameters for the treatment plant. Sheens in the East Ditch were not observed during the April 2014 through September 2014 monitoring period.

3.1 Groundwater

The second and third quarter 2014 sampling events include groundwater sample collection from monitoring well GW-16R. The groundwater samples are collected and analyzed for trimethylpentenes, n-nitrosodiphenylamine (NDPhA), bis(2-ethylhexyl)phthalate (BEHP), volatile petroleum hydrocarbons (VPH), ammonia, iron, and pH. The second and third quarter 2014 sample locations, details of sampling, and the analytical program are described in the field activity reports (**Appendices A-1 and A-2**, respectively). **Tables 3-2 and 3-3** present analytical results from the second and third quarter 2014 groundwater sampling events, respectively. Data validation reports for the second and third quarter 2014 sampling events are included in **Appendix B**. The second and third quarter 2014 data validation memos indicate the analytical results are useable as reported by the laboratory unless otherwise indicated in the validation report. Validation actions included qualification of methyl tertbutyl ether data as non-detect in GW-16R at Plant B due to laboratory blank contamination for May and August, and qualification of the May initial result for NDPhA as estimated (J) due to hold times that were exceeded when the sample was re-analyzed at a 10X dilution. The pH results were qualified as estimated (J) for hold time.

Second quarter 2014 and third quarter 2014 analytical results for trimethylpentenes, NDPhA, BEHP, VPH, ammonia, iron, and pH in groundwater are consistent with past results.

Olin personnel measure groundwater levels from 25 monitoring wells and three groundwater extraction wells (IW-11, IW-12, and IW-13) on a monthly frequency. If the water level probe suggests the presence of LNAPL, the thickness of the LNAPL is measured. The monthly water table elevation data are presented in **Tables 3-4 and 3-5** and in **Figures 3-1 through 3-6** from April 2014 through September 2014.

3.2 Light Non-Aqueous Phase Liquid

The LNAPL layer in the vicinity of the Plant B treatment plant is extremely thin. A protocol for LNAPL thickness measurement and confirmation of LNAPL presence via visual observation was developed previously to address the interpretation of instrument response for what appears to be a very thin LNAPL layer at and below the meter sensitivity for detection (less than 0.01 feet). The LNAPL thickness measurement data are presented in **Figures 3-7 through 3-12** from April 2014 through September 2014. LNAPL has been observed in both the observation wells and groundwater extractions wells. A thin layer of LNAPL has been measured in observation well GW-23 and IW-11. Trace amounts of LNAPL (sheen) have been observed in wells IW-2, IW-3, IW-13, P5, PID, and 12-IN.

The monthly LNAPL recovery data are presented in **Tables 3-4 and 3-5**. Over the reporting period, on average, 0.28 gallons of LNAPL is recovered per month. The total LNAPL recovered for the April 2014 through September 2014 period was 1.66 gallons (more than the previous six-month period). Monthly and cumulative LNAPL recovery data are summarized in **Figure 3-13**. Groundwater levels relative to monthly LNAPL recovery are plotted and summarized in **Figure 3-14**.

The LNAPL recovery data indicate a stabilization of the LNAPL recovery rate since 2008 with all the recovered LNAPL coming from IW-11. The proposed pumping rate reduction test to evaluate the effect of water levels on LNAPL recovery continues to be postponed.

4.0 DAPL EXTRACTION PILOT TEST

This section reports progress on the DAPL Pilot Study and summarizes communication between Olin and USEPA for the reporting period (April 2014 through September 2014).

4.1 Operations Status

Construction of the DAPL Extraction Pilot Test system apparatus was completed in September 2012. The DAPL pilot program began in November 2012 at a pumping rate of 0.5 gpm. Phase 2 of the DAPL pilot study began on March 5, 2013 and the pumping rate was increased to 1.0 gpm. The active DAPL extraction phase was terminated on May 22, 2014 after discussion with USEPA and concerns that DAPL drawdown had become excessive in proximity to the extraction well at the highest pumping rate of 2 gpm. Olin continues to monitor rebound and provide monitoring results to USEPA. All of the equipment related to the pilot system is maintained in an operation-ready status.

4.2 Reporting Status

Olin prepared and submitted a DAPL Extraction Pilot Study Performance Evaluation Report to USEPA on November 7, 2014. Subsequent to that deliverable, Olin has prepared and submitted addition plots of monitoring data. Olin continues to provide data from the post pumping recovery period to USEPA shortly after data are collected, processed and reviewed. Those data are not provided in this SASR.

5.0 ADDITIONAL ACTIVITIES

During the reporting period for this SASR, Olin has submitted the following documents as described below. In addition, quarterly residential drinking water samples were collected from several residences in proximity of the Site. Additional Remedial Investigation (RI) activities that were conducted are also described.

5.1 Major Submittals, Meetings and Other RI/FS Activities

- On September 5, 2014 Olin submitted the OU3 Data Gap Analysis and Supplemental Work Plan. Based on USEPA comments, this document was revised and resubmitted on December 15, 2014.
- On October 24, 2014 Olin submitted a revised *Phase II Hydraulic Pulse Interference Test (HPIT) Work Plan* that addressed USEPA comments on an earlier draft.
- On November 7, 2014 Olin submitted the *DAPL Extraction Pilot Study Performance Evaluation Report*.
- On December 12, 2014 Olin submitted responses to USEPA comments on the OU1/OU2 Draft Final Remedial Investigation Report.

5.2 Residential Drinking Water Sampling

The following paragraphs summarize water supply sampling activities at residential locations in accordance with methods in the approved RI/FS Work Plan, and as modified by the Summary Report for the 2010 Residential Drinking Water Program and the Phase I Private Well Sampling proposal.

Private well sampling was completed on May 20-22, 2014. Seven residences: Map 2/Lot 7, Map 15/Lot 2C, Map 24/Lot 54, Map 24/Lot 63, Map 24/Lot 64, Map 24/Lot 94, and Map 27/Lot 14C were sampled and analyzed for the following parameters: SVOCs, NDMA, N-nitroso di-n-propylamine (NDPrA), metals, hexavalent chromium, anions (chloride, sulfate, nitrate, nitrite), and ammonia. Three residences: Map 24/Lot 65, Map 24/Lot 66, and Map 24/Lot 72 were sampled and analyzed for: NDMA, NDPrA, metals, anions, and ammonia. Two residences: Map 14/Lot 2B, Map 24/Lot 87 was sampled and analyzed for: NDMA, NDPrA, metals, hexavalent chromium, anions, and ammonia. Residence locations Map 3/Lot 7, Map 1/Lot 6D, Map 1/Lot 6C, Map 3/Lot 2F, Map 3/Lot 2, and Map 3/Lot 2D were sampled and analyzed for NDMA only. New residences added to the sampling program include: Map 15/Lot 3A and Map 24/Lot 116. Samples from these wells were analyzed for NDMA only.

On August 5, 2014, private well location Map 2/Lot 7 was re-sampled for the analysis listed above. Due to broken glassware, the same well was re-sampled for NDMA only on August 14, 2014.

Private well sampling was completed on September 10-11, 2014 from the same residences and same analysis as listed above. The following two properties were the exceptions: Map 24/Lot 87 was not sampled due to a property transfer; Map 15/Lot 3A refused additional sampling.

Data from the May 2014, August 2014, and September 2014 residential drinking water sampling events are summarized in **Tables 5-1 and 5-2**, respectively. The validation memoranda for the private well sampling events are attached in **Appendix B**.

5.3 Plant B Pumping Rate Reduction Test

The proposed Pumping Rate Reduction test which has been approved by USEPA remains on hold.

5.4 OU1 and OU2 Remedial Investigation Sampling and Analytical Results

No additional OU1 and OU2 sampling activities have been completed during this reporting period.

5.5 OU3 Remedial Investigation Groundwater Sampling and Analytical Results

No additional OU3 sampling activities have been completed during this reporting period.

5.6 Calcium Sulfate Landfill

Consistent with the Massachusetts Department of Environmental Protection (MassDEP) approved semi-annual monitoring schedule (May and November), Olin conducted groundwater sampling at the Calcium Sulfate Landfill (CSL) in May 2014. Groundwater was collected from select monitoring wells identified in **Figure 5-1**. Samples were collected and submitted by Olin personnel for the following analysis: total dissolved solids (TDS), total metals (calcium, sodium, aluminum, manganese, iron, chromium, and nickel), chloride, sulfate, and alkalinity. The data validation memorandum for the CSL groundwater monitoring program is attached in **Appendix B**. The CSL data will be summarized and submitted to MassDEP in the 2015 biennial report.

6.0 REFERENCES

AMEC Environment & Infrastructure, Inc. (AMEC), 2012. Operations, Maintenance & Performance Monitoring Plan, DAPL Extraction Pilot Test for the Olin Chemical Superfund Site in Wilmington, MA, October 8, 2012.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2008. *Final Interim Response Steps Work Plan*, *Olin Chemical Superfund Site, Wilmington, Massachusetts*. August 8, 2008.

TABLES

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-10S 5/19/2014	OC-GW-24 5/19/2014	OC-GW-34D 5/21/2014	OC-DUP GW 5/21/2014	OC-GW-34SR 5/21/2014	OC-GW-35S 5/21/2014	OC-GW-76S 5/19/2014	OC-GW-CA1 5/21/2014
Metals, Filtered (mg/L)								
Aluminum	3.7	0.2 U	0.06 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.005 U	0.005 U	0.015	0.0017 J	0.0016 J	0.0087	0.002 J	0.0084
Inorganics (mg/L)								
Chloride	12	46	4.4	1.5	1.6	3.9	46	4.7
Nitrogen, as Ammonia	1.8 J	23 J	12 J	0.12 J	0.17 J	11 J	9.5 J	0.61 J
Specific Conductance **(mS/cm)**	0.18	0.4	0.18	0.056	0.058	1.4	0.31	0.45
Sulfate	60	32	33	7.6	8.3	530	24	55

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-202D DUP 5/20/2014	OC-GW-202D 5/20/2014	OC-GW-202S 5/20/2014	OC-GW-25 5/19/2014	OC-PZ-18R 5/21/2014	OC-PZ-25 5/20/2014	OC-GW-201S 5/27/2014	OC-GW-43SR 5/27/2014	OC-GW-78S 5/22/2014
Metals, Filtered (mg/L)									
Aluminum	5.6	5.3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.42	0.2 U
Chromium	0.58	0.55	0.0036 J	0.0056	0.058	0.011	0.047	0.0029 J	0.0033 J
Inorganics (mg/L)									
Chloride	260	270	94	230	630	19	57	310	20
Nitrogen, as Ammonia	96 J	180 J	30	23	400	29	92	4.8	38
Specific Conductance **(mS/cm)**	4	4	0.92	1.1	5.6	1.4	2.6	1.1	1.4
Sulfate	1600 J	2000	210 J	70	1900	510	1200	33	500

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 2-1
Slurry Wall/Cap Analytical Results for Second Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-79S 5/22/2014	OC-PZ-16RR 5/22/2014	OC-PZ-17RR 5/22/2014	OC-PZ-24 5/22/2014
Metals, Filtered (mg/L)				
Aluminum	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	0.0046 J	0.0073	0.0057	0.025
Inorganics (mg/L)				
Chloride	120	120	18	18
Nitrogen, as Ammonia	98	93	35	47
Specific Conductance **(mS/cm)**	2.1	2.3	1.4	1.8
Sulfate	730	890	480	650

mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/15/14

Table 2-2
Slurry Wall/Cap Analytical Results for Third Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-202D 8/20/2014	OC-GW-202S 8/19/2014	OC-GW-25 8/21/2014	OC-GW-78S 8/19/2014	OC-GW-79S 8/20/2014	OC-PZ-16RR 8/20/2014	OC-PZ-17RR 8/21/2014	OC-PZ-18R 8/20/2014	OC-PZ-24 8/19/2014	OC-PZ-25 8/19/2014
Metals, Filtered (mg/L)										
Aluminum	4.6	4.5	0.2 U	0.2 U	0.2 U	0.2 U	0.066 J	0.2 U	0.2 U	0.2 U
Chromium	0.48	0.45	0.0048 J	0.0035 J	0.0038 J	0.0052	0.0065	0.024	0.029	0.012
Inorganics (mg/L)										
Chloride	260	120	230	16	21	200	15	280	15	19
Nitrogen, as Ammonia	0.2 U	30	37	30	27	90	34	71	45	35
Specific Conductance **(mS/cm)**	2.9	0.84	0.89	1.2	1.3	1.6	1.2	1.5	1.6	1.2
Sulfate	1700	160	44	580	610	350	520	290	880	540

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/15/14

Table 2-3
Slurry Wall/Cap Analytical Results for Second Quarter 2014 Surface Water Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-ISCO1 5/29/2014	OC-ISCO2 5/29/2014	OC-ISCO3 5/29/2014	OC-PZ-16RRSW 5/29/2014	OC-PZ-17RRSW 5/29/2014	OC-DUP SW 5/29/2014	OC-PZ-18RSW 5/29/2014	OC-SD-17 5/29/2014
Metals, Total (mg/L)								
Aluminum	0.22	2.3	0.098 J	1.6	1.1	0.24	0.23	1.1
Chromium	0.009	0.35	0.005 U	0.27	0.2	0.0083	0.0087	0.21
Sodium	90	91	100	97	110	89	88	110
Metals, Filtered (mg/L)								
Aluminum	0.073 J	0.14 J	0.2 U	0.16 J	0.061 J	0.078 J	0.2 U	0.098 J
Chromium	0.0046 J	0.025	0.005 U	0.039	0.03	0.0047 J	0.0053	0.029
Sodium	82	85	100	97	110	86	84	110
Inorganics (mg/L)								
Chloride	160	140	210	160	180	160	170	180
Nitrate as N	0.26	1.1	0.92	1.6	2.3	0.26	0.24	2.4
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Nitrogen, as Ammonia	10	17	1.1	15	14	11	9.7	16
Specific Conductance **(mS/cm)**	0.74	0.84	0.89	0.89	0.96	0.73	0.73	0.96
Sulfate	58	140	27	130	130	56	56	130

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - not detected,
value is the detection limit
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/15/14

Table 2-4
Slurry Wall/Cap Analytical Results for Third Quarter 2014 Surface Water Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-ISCO1 8/26/2014	OC-ISCO2 8/26/2014	OC-ISCO3 8/26/2014	OC-PZ-16RRSW 8/26/2014	OC-PZ-17RRSW 8/26/2014	OC-PZ-18RSW 8/26/2014	OC-SD-17SW 8/26/2014
Metals, Total (mg/L)							
Aluminum	0.13 J	0.07 J	0.94	1.6	5.5	0.092 J	3.9
Chromium	0.0085	0.016	0.0057	0.43	1.2	0.0091	0.86
Sodium	110	110	100 J	220	200	110	180
Metals, Filtered (mg/L)							
Aluminum	0.2 U	0.2 U	0.2 U	0.26	2.6	0.2 U	0.46
Chromium	0.0061	0.0094	0.0015 J	0.17	0.62	0.0062	0.2
Sodium	110	110	110 J	220	200	110	190
Inorganics (mg/L)							
Chloride	210	150	250	300	270	210	280
Nitrate as N	0.2	0.96	0.77	1.2	4	0.23	4.3
Nitrite as N	0.05 U	0.022 J	0.05 U	0.025 J	0.024 J	0.05 U	0.027 J
Nitrogen, as Ammonia	33	50	0.5 U	90	66	27	6.2
Specific Conductance **(mS/cm)**	0.91	1.2	0.8	2.1	1.7	0.9	1.6
Sulfate	150	490	20	880	510	150	470

Notes:
mg/L - milligrams per liter
mS/cm - milliSiemen per centimeter
U - not detected,
value is the detection limit
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/15/14

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW Frac 9. 040114 4/1/2014	IDW Frac 5. 040414 4/4/2014	IDW Frac 1. 040914 4/9/2014	IDW Frac 2. 040814 4/8/2014	IDW Frac 3. 041014 4/10/2014	IDW Frac 9. 041114 4/11/2014	IDW Frac 5. 041514 4/15/2014	IDW Frac A. 041614 4/16/2014	IDW Frac 2. 041814 4/18/2014	IDW Frac 1. 042114 4/21/2014	IDW Frac 4. 042314 4/23/2014	IDW Frac 6. 042414 4/24/2014
VOCs (mg/L)												
Ethyl benzene												
1,4-Dichlorobenzene												
1,2-Dichloroethane												
2,4,4-Trimethyl-1-pentene												
2,4,4-Trimethyl-2-pentene												
Toluene												
Chlorobenzene												
1,4-Dioxane												
Tetrachloroethene												
Cis-1,2-Dichloroethene												
Methyl Tertbutyl Ether												
Xylenes (m&p)												
1,3-Dichlorobenzene												
Carbon tetrachloride												
Acetone												
Chloroform												
Benzene												
1,1,1-Trichloroethane												
Vinyl chloride												
Methylene chloride												
1,1-Dichloroethane												
1,1-Dichloroethene												
t-Butyl alcohol												
2-Butanone												
1,1,2-Trichloroethane												
Trichloroethene												
Naphthalene												
Xylene, o												
1,2-Dichlorobenzene												
Butane, 2-methoxy-2-methyl-												
Phenolics, Total Recoverable	0.01 U	0.01 U	0.0051 J B	0.0052 J B	0.01 U	0.01 U	0.01 U	0.0089 J	0.01 U	0.01 U	0.0088 J	0.01 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW Frac 9. 040114 4/1/2014	IDW Frac 5. 040414 4/4/2014	IDW Frac 1. 040914 4/9/2014	IDW Frac 2. 040814 4/8/2014	IDW Frac 3. 041014 4/10/2014	IDW Frac 9. 041114 4/11/2014	IDW Frac 5. 041514 4/15/2014	IDW Frac A. 041614 4/16/2014	IDW Frac 2. 041814 4/18/2014	IDW Frac 1. 042114 4/21/2014	IDW Frac 4. 042314 4/23/2014	IDW Frac 6. 042414 4/24/2014
SVOCs (mg/L)												
1,4-Dichlorobenzene												
2,4,5-Trichlorophenol												
2,4,6-Trichlorophenol												
2,4-Dichlorophenol												
2,4-Dimethylphenol												
2,4-Dinitrophenol												
2,4-Dinitrotoluene												
2-Chlorophenol												
2-Methylphenol												
2-Nitrophenol												
3 & 4 Methylphenol												
3-Methylphenol												
4,6-Dinitro-2-methylphenol												
4-Chloro-3-methylphenol												
4-Methylphenol												
4-Nitrophenol												
Acenaphthene												
Acenaphthylene												
Anthracene												
Benzo(a)anthracene												
Benzo(a)pyrene												
Benzo(b)fluoranthene												
Benzo(ghi)perylene												
Benzo(k)fluoranthene												
Bis(2-Ethylhexyl)phthalate	4.6	1.9 U	4.7 U	0.4 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Butylbenzylphthalate	0.38 J	0.3 J	0.22 J B	2.8 U	0.31 J	0.32 J	0.17 J	0.96 U	0.38 J	0.78 J	0.36 J	0.41 J
Chrysene												
Dibenz(a,h)anthracene												
Diethylphthalate	0.25 J	0.96 U	0.47 U	0.47 U	0.96 U	0.96 U	0.96 U	0.96 U	0.22 J	0.14 J	0.96 U	0.96 U
Dimethylphthalate	0.96 U	0.96 U	0.47 U	0.47 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
Di-n-butylphthalate	0.96 U	0.96 U	1.9 U	1.9 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
Di-n-octylphthalate	0.96 U	0.96 U	4.7 U *	4.7 U *	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
Fluoranthene												
Fluorene												
Hexachlorobenzene												
Hexachlorobutadiene												
Hexachloroethane												
Indeno(1,2,3-cd)pyrene												
Naphthalene												
Nitrobenzene												
Pentachlorophenol												
Phenanthrene												
Phenol												
Pyrene												
Pyridine												
1,2-Dibromoethane												

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW Frac 9. 040114 4/1/2014	IDW Frac 5. 040414 4/4/2014	IDW Frac 1. 040914 4/9/2014	IDW Frac 2. 040814 4/8/2014	IDW Frac 3. 041014 4/10/2014	IDW Frac 9. 041114 4/11/2014	IDW Frac 5. 041514 4/15/2014	IDW Frac A. 041614 4/16/2014	IDW Frac 2. 041814 4/18/2014	IDW Frac 1. 042114 4/21/2014	IDW Frac 4. 042314 4/23/2014	IDW Frac 6. 042414 4/24/2014
TPH (mg/L)												
Total Petroleum Hydrocarbons												
PCBs (mg/L)												
Heptachlor epoxide												
Aroclor-1260												
Aroclor-1254												
Aroclor-1221												
Aroclor-1232												
Aroclor-1248												
Aroclor-1016												
Aroclor-1242												
Chlordane												
Gamma-BHC/Lindane												
Endrin												
Methoxychlor												
Heptachlor												
Toxaphene												
Herbicides (mg/L)												
2,4,5-TP/Silvex												
2,4-D												
Total Metals (mg/L)												
Chromium												
Chromium, Trivalent												
Chromium, Hexavalent												
Iron	50 U	50 U	50 U	50 U	50 U	11 J B	50 U	50 U	50 U	50 U	50 U	50 U
Lead												
Mercury												
Nickel	10 U	3.4 J	10 U	3.2 J	2.1 J B	3.8 J B	10 U	10 U	10 U	0.65 J	2.2 J	10 U
Silver												
Antimony												
Arsenic	10 U	10 U	10 U	10 U	10 U	10 U	10 U *	10 U	10 U	10 U	10 U	10 U
Barium												
Cadmium												
Copper												
Zinc	5.6 J	22	4.5 J	18	11 B	28 B	5.6 J	6.2 J	7.9 J	4.9 J B	17	6.3 J
Selenium												
Inorganic Compounds (mg/L)												
Chloride	230	230	230	230	230	230	120	240	220	210	210	180
Cyanide, Total												
Chlorine	0.02 U	0.02 U	0.02 U	0.02 U H	0.02 U H	0.02 U	0.02 U	0.02 U H	0.02 U	0.02 U	0.02 U	0.02 U H
Total Suspended Solids	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
B - Compound was found in the
blank and sample
* - LCS or LCSD exceeds the
control limits
HF - Field parameter with a
holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC - Frac 5. 042914 4/29/2014	IDW Frac 2. 043014 4/30/2014	IDW Frac 1. 050214 5/2/2014	IDW Frac 3. 050114 5/1/2014	IDW Frac 6. 050814 5/8/2014	IDW Frac 4. 050714 5/7/2014	IDW Frac 5. 051214 5/12/2014	IDW OC - Frac 2. 051414 5/14/2014	IDW OC-Frac 1. 052014 5/20/2014	IDW OC-Frac 3. 051914 5/19/2014	IDW OC-Frac 5. 052114 5/21/2014
VOCs (mg/L)											
Ethyl benzene											
1,4-Dichlorobenzene											
1,2-Dichloroethane											
2,4,4-Trimethyl-1-pentene											
2,4,4-Trimethyl-2-pentene											
Toluene											
Chlorobenzene											
1,4-Dioxane											
Tetrachloroethene											
Cis-1,2-Dichloroethene											
Methyl Tertbutyl Ether											
Xylenes (m&p)											
1,3-Dichlorobenzene											
Carbon tetrachloride											
Acetone											
Chloroform											
Benzene											
1,1,1-Trichloroethane											
Vinyl chloride											
Methylene chloride											
1,1-Dichloroethane											
1,1-Dichloroethene											
t-Butyl alcohol											
2-Butanone											
1,1,2-Trichloroethane											
Trichloroethene											
Naphthalene											
Xylene, o											
1,2-Dichlorobenzene											
Butane, 2-methoxy-2-methyl-											
Phenolics, Total Recoverable	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC - Frac 5. 042914 4/29/2014	IDW Frac 2. 043014 4/30/2014	IDW Frac 1. 050214 5/2/2014	IDW Frac 3. 050114 5/1/2014	IDW Frac 6. 050814 5/8/2014	IDW Frac 4. 050714 5/7/2014	IDW Frac 5. 051214 5/12/2014	IDW OC - Frac 2. 051414 5/14/2014	IDW OC-Frac 1. 052014 5/20/2014	IDW OC-Frac 3. 051914 5/19/2014	IDW OC-Frac 5. 052114 5/21/2014
SVOCs (mg/L)											
1,4-Dichlorobenzene											
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											
2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2-Chlorophenol											
2-Methylphenol											
2-Nitrophenol											
3 & 4 Methylphenol											
3-Methylphenol											
4,6-Dinitro-2-methylphenol											
4-Chloro-3-methylphenol											
4-Methylphenol											
4-Nitrophenol											
Acenaphthene											
Acenaphthylene											
Anthracene											
Benzo(a)anthracene											
Benzo(a)pyrene											
Benzo(b)fluoranthene											
Benzo(ghi)perylene											
Benzo(k)fluoranthene											
Bis(2-Ethylhexyl)phthalate	1.9 U	1.9 U	1.9 U	1.9 U	1.5 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Butylbenzylphthalate	0.16 J	0.29 J	0.22 J	0.22 J	0.37 J	31	0.18 J	0.25 J	0.42 J	0.47 J	0.27 J
Chrysene											
Dibenz(a,h)anthracene											
Diethylphthalate	1.6	1.8	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.94 U	0.94 U	0.94 U	0.94 U
Dimethylphthalate	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.94 U	0.94 U	0.94 U	0.94 U
Di-n-butylphthalate	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.94 U	0.94 U	0.94 U	0.94 U
Di-n-octylphthalate	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.41 J	0.95 U	0.94 U	0.94 U	0.94 U	0.94 U
Fluoranthene											
Fluorene											
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene											
Naphthalene											
Nitrobenzene											
Pentachlorophenol											
Phenanthrene											
Phenol											
Pyrene											
Pyridine											
1,2-Dibromoethane											

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC - Frac 5. 042914 4/29/2014	IDW Frac 2. 043014 4/30/2014	IDW Frac 1. 050214 5/2/2014	IDW Frac 3. 050114 5/1/2014	IDW Frac 6. 050814 5/8/2014	IDW Frac 4. 050714 5/7/2014	IDW Frac 5. 051214 5/12/2014	IDW OC - Frac 2. 051414 5/14/2014	IDW OC-Frac 1. 052014 5/20/2014	IDW OC-Frac 3. 051914 5/19/2014	IDW OC-Frac 5. 052114 5/21/2014
TPH (mg/L)											
Total Petroleum Hydrocarbons											
PCBs (mg/L)											
Heptachlor epoxide											
Aroclor-1260											
Aroclor-1254											
Aroclor-1221											
Aroclor-1232											
Aroclor-1248											
Aroclor-1016											
Aroclor-1242											
Chlordane											
Gamma-BHC/Lindane											
Endrin											
Methoxychlor											
Heptachlor											
Toxaphene											
Herbicides (mg/L)											
2,4,5-TP/Silvex											
2,4-D											
Total Metals (mg/L)											
Chromium											
Chromium, Trivalent											
Chromium, Hexavalent											
Iron	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Lead											
Mercury											
Nickel	10 U	10 U	10 U	1.3 J	10 U	10 U	10 U	3.7 J	10 U	0.61 J	10 U
Silver											
Antimony											
Arsenic	10 U *	10 U *	10 U *	10 U *	10 U	10 U	10 U	3.7 J	10 U	10 U	10 U
Barium											
Cadmium											
Copper											
Zinc	14	13	16	22	6.1 J	10	6.7 J	26	8.4 J	8.3 J	9.6 J
Selenium											
Inorganic Compounds (mg/L)											
Chloride	190	190	180	190	180	180	190	200	210	210	54
Cyanide, Total											
Chlorine	0.02 U H	0.02 U	0.02 U	0.02 U H	0.02 U	0.02 U H	0.02 U	0.02 U	0.02 U	0.02 U H	0.02 U
Total Suspended Solids	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
B - Compound was found in the
blank and sample
* - LCS or LCSD exceeds the
control limits
HF - Field parameter with a
holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW Frac 4. 052714 5/27/2014	IDW Frac 6. 052814 5/28/2014	IDW OC Frac 2. 053014 5/30/2014	IDW OC Frac 1. 060214 6/2/2014	IDW OC FRAC 3 060414 6/9/2014	IDW OC Frac 3. 060414 6/4/2014	IDW OC Frac 5. 060514 6/5/2014	IDW OC-Frac 4. 060914 6/9/2014	IDW OC Frac 6. 061114 6/11/2014	IDW OC Frac 2. 061314 6/13/2014
VOCs (mg/L)										
Ethyl benzene										
1,4-Dichlorobenzene										
1,2-Dichloroethane										
2,4,4-Trimethyl-1-pentene										
2,4,4-Trimethyl-2-pentene										
Toluene										
Chlorobenzene										
1,4-Dioxane										
Tetrachloroethene										
Cis-1,2-Dichloroethene										
Methyl Tertbutyl Ether										
Xylenes (m&p)										
1,3-Dichlorobenzene										
Carbon tetrachloride										
Acetone										
Chloroform										
Benzene										
1,1,1-Trichloroethane										
Vinyl chloride										
Methylene chloride										
1,1-Dichloroethane										
1,1-Dichloroethene										
t-Butyl alcohol										
2-Butanone										
1,1,2-Trichloroethane										
Trichloroethene										
Naphthalene										
Xylene, o										
1,2-Dichlorobenzene										
Butane, 2-methoxy-2-methyl-										
Phenolics, Total Recoverable	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
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Wilmington, Massachusetts

Parameter Name	IDW Frac 4. 052714 5/27/2014	IDW Frac 6. 052814 5/28/2014	IDW OC Frac 2. 053014 5/30/2014	IDW OC Frac 1. 060214 6/2/2014	IDW OC FRAC 3 060414 6/9/2014	IDW OC Frac 3. 060414 6/4/2014	IDW OC Frac 5. 060514 6/5/2014	IDW OC-Frac 4. 060914 6/9/2014	IDW OC Frac 6. 061114 6/11/2014	IDW OC Frac 2. 061314 6/13/2014
SVOCs (mg/L)										
1,4-Dichlorobenzene										
2,4,5-Trichlorophenol										
2,4,6-Trichlorophenol										
2,4-Dichlorophenol										
2,4-Dimethylphenol										
2,4-Dinitrophenol										
2,4-Dinitrotoluene										
2-Chlorophenol										
2-Methylphenol										
2-Nitrophenol										
3 & 4 Methylphenol										
3-Methylphenol										
4,6-Dinitro-2-methylphenol										
4-Chloro-3-methylphenol										
4-Methylphenol										
4-Nitrophenol										
Acenaphthene										
Acenaphthylene										
Anthracene										
Benzo(a)anthracene										
Benzo(a)pyrene										
Benzo(b)fluoranthene										
Benzo(ghi)perylene										
Benzo(k)fluoranthene										
Bis(2-Ethylhexyl)phthalate	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U		1.9 U	1.9 U	1.9 U	3.9
Butylbenzylphthalate	0.19 J	0.94 U	0.13 J	0.94 U	0.94 U		0.94 U	0.23 J	0.61 J	0.96 U
Chrysene										
Dibenz(a,h)anthracene										
Diethylphthalate	0.96 U	0.94 U	0.94 U	0.94 U	0.94 U		0.94 U	0.94 U	0.18 J	0.96 U
Dimethylphthalate	0.96 U	0.94 U	0.94 U	0.94 U	0.94 U		0.94 U	0.94 U	0.95 U	0.96 U
Di-n-butylphthalate	0.96 U	0.94 U	0.94 U	0.94 U	0.94 U		0.94 U	0.94 U	0.95 U	0.96 U
Di-n-octylphthalate	0.96 U	0.94 U	0.94 U	0.94 U	0.94 U		0.94 U	0.94 U	0.95 U	0.96 U
Fluoranthene										
Fluorene										
Hexachlorobenzene										
Hexachlorobutadiene										
Hexachloroethane										
Indeno(1,2,3-cd)pyrene										
Naphthalene										
Nitrobenzene										
Pentachlorophenol										
Phenanthrene										
Phenol										
Pyrene										
Pyridine										
1,2-Dibromoethane										

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW Frac 4. 052714 5/27/2014	IDW Frac 6. 052814 5/28/2014	IDW OC Frac 2. 053014 5/30/2014	IDW OC Frac 1. 060214 6/2/2014	IDW OC FRAC 3 060414 6/9/2014	IDW OC Frac 3. 060414 6/4/2014	IDW OC Frac 5. 060514 6/5/2014	IDW OC-Frac 4. 060914 6/9/2014	IDW OC Frac 6. 061114 6/11/2014	IDW OC Frac 2. 061314 6/13/2014
TPH (mg/L)										
Total Petroleum Hydrocarbons										
PCBs (mg/L)										
Heptachlor epoxide										
Aroclor-1260										
Aroclor-1254										
Aroclor-1221										
Aroclor-1232										
Aroclor-1248										
Aroclor-1016										
Aroclor-1242										
Chlordane										
Gamma-BHC/Lindane										
Endrin										
Methoxychlor										
Heptachlor										
Toxaphene										
Herbicides (mg/L)										
2,4,5-TP/Silvex										
2,4-D										
Total Metals (mg/L)										
Chromium										
Chromium, Trivalent										
Chromium, Hexavalent										
Iron	50 U	50 U	50 U	50 U	50 U		50 U	50 U	50 U	50 U
Lead										
Mercury										
Nickel	10 U	10 U	10 U	10 U	10 U		10 U	1.7 J	1.8 J B	10 U
Silver										
Antimony										
Arsenic	10 U	10 U	10 U	10 U	10 U		10 U	3.1 J	10 U	10 U
Barium										
Cadmium										
Copper										
Zinc	9.9 J B	7.5 J	8.2 J	11	10 U		9.5 J	34	9.2 J	7.3 J B
Selenium										
Inorganic Compounds (mg/L)										
Chloride	210	210	220	220		210	210	220	210	210
Cyanide, Total										
Chlorine	0.02 U	0.02 U H	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total Suspended Solids	4 U	4 U	4 U	4 U		4 U	4 U	4 U	4 U	4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC Frac 1. 061714 6/17/2014	IDW OC Frac 3. 061914 6/19/2014	IDW OC Frac 5. 062514 6/25/2014	IDW OC Frac 4. 062614 6/26/2014	IDW OC Frac 6. 063014 6/30/2014	IDW OC Frac 1. 070214 7/2/2014	IDW OC Frac 3. 070914 7/9/2014	IDW Frac5-070914 7/9/2014	IDW OC Frac 2. 071114 7/11/2014	IDW OC Frac 1. 071614 7/16/2014
VOCs (mg/L)										
Ethyl benzene										
1,4-Dichlorobenzene										
1,2-Dichloroethane										
2,4,4-Trimethyl-1-pentene										
2,4,4-Trimethyl-2-pentene										
Toluene										
Chlorobenzene										
1,4-Dioxane										
Tetrachloroethene										
Cis-1,2-Dichloroethene										
Methyl Tertbutyl Ether										
Xylenes (m&p)										
1,3-Dichlorobenzene										
Carbon tetrachloride										
Acetone										
Chloroform										
Benzene										
1,1,1-Trichloroethane										
Vinyl chloride										
Methylene chloride										
1,1-Dichloroethane										
1,1-Dichloroethene										
t-Butyl alcohol										
2-Butanone										
1,1,2-Trichloroethane										
Trichloroethene										
Naphthalene										
Xylene, o										
1,2-Dichlorobenzene										
Butane, 2-methoxy-2-methyl-										
Phenolics, Total Recoverable	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
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Parameter Name	IDW OC Frac 1. 061714 6/17/2014	IDW OC Frac 3. 061914 6/19/2014	IDW OC Frac 5. 062514 6/25/2014	IDW OC Frac 4. 062614 6/26/2014	IDW OC Frac 6. 063014 6/30/2014	IDW OC Frac 1. 070214 7/2/2014	IDW OC Frac 3. 070914 7/9/2014	IDW Frac5-070914 7/9/2014	IDW OC Frac 2. 071114 7/11/2014	IDW OC Frac 1. 071614 7/16/2014
SVOCs (mg/L)										
1,4-Dichlorobenzene										
2,4,5-Trichlorophenol										
2,4,6-Trichlorophenol										
2,4-Dichlorophenol										
2,4-Dimethylphenol										
2,4-Dinitrophenol										
2,4-Dinitrotoluene										
2-Chlorophenol										
2-Methylphenol										
2-Nitrophenol										
3 & 4 Methylphenol										
3-Methylphenol										
4,6-Dinitro-2-methylphenol										
4-Chloro-3-methylphenol										
4-Methylphenol										
4-Nitrophenol										
Acenaphthene										
Acenaphthylene										
Anthracene										
Benzo(a)anthracene										
Benzo(a)pyrene										
Benzo(b)fluoranthene										
Benzo(ghi)perylene										
Benzo(k)fluoranthene										
Bis(2-Ethylhexyl)phthalate	1.9 U	1.9 U	92 E	2.8	1.9 U	4.5	1.9 U	2.2	1.9 U	1.8 J
Butylbenzylphthalate	0.18 J	0.28 J	9.5 U	0.95 U	0.17 J	0.23 J	0.47 J	0.95 U	0.13 J	0.21 J
Chrysene										
Dibenz(a,h)anthracene										
Diethylphthalate	0.94 U	0.95 U	9.5 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.94 U	0.15 J
Dimethylphthalate	0.94 U	0.95 U	9.5 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U
Di-n-butylphthalate	0.94 U	0.95 U	9.5 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U
Di-n-octylphthalate	0.94 U	0.95 U	9.5 U	0.95 U	0.95 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U
Fluoranthene										
Fluorene										
Hexachlorobenzene										
Hexachlorobutadiene										
Hexachloroethane										
Indeno(1,2,3-cd)pyrene										
Naphthalene										
Nitrobenzene										
Pentachlorophenol										
Phenanthrene										
Phenol										
Pyrene										
Pyridine										
1,2-Dibromoethane										

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
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Wilmington, Massachusetts

Parameter Name	IDW OC Frac 1. 061714 6/17/2014	IDW OC Frac 3. 061914 6/19/2014	IDW OC Frac 5. 062514 6/25/2014	IDW OC Frac 4. 062614 6/26/2014	IDW OC Frac 6. 063014 6/30/2014	IDW OC Frac 1. 070214 7/2/2014	IDW OC Frac 3. 070914 7/9/2014	IDW Frac5-070914 7/9/2014	IDW OC Frac 2. 071114 7/11/2014	IDW OC Frac 1. 071614 7/16/2014
TPH (mg/L)										
Total Petroleum Hydrocarbons										
PCBs (mg/L)										
Heptachlor epoxide										
Aroclor-1260										
Aroclor-1254										
Aroclor-1221										
Aroclor-1232										
Aroclor-1248										
Aroclor-1016										
Aroclor-1242										
Chlordane										
Gamma-BHC/Lindane										
Endrin										
Methoxychlor										
Heptachlor										
Toxaphene										
Herbicides (mg/L)										
2,4,5-TP/Silvex										
2,4-D										
Total Metals (mg/L)										
Chromium										
Chromium, Trivalent										
Chromium, Hexavalent										
Iron	50 U	50 U	50 U	50 U	50 U	50 U	50 U		50 U	50 U
Lead										
Mercury										
Nickel	1.9 J B	10 U	10 U	1.8 J B	1.3 J B	1.4 J B	10 U		10 U	10 U
Silver										
Antimony										
Arsenic	10 U	3.1 J	10 U	10 U	3.1 J B	10 U	10 U		10 U	3 J
Barium										
Cadmium										
Copper										
Zinc	7.7 J	8.5 J	6 J	11	7.2 J	6.5 J	5.7 J		5.8 J	6.3 J
Selenium										
Inorganic Compounds (mg/L)										
Chloride	210	220 B	220 B	220 B	220 B	220	230 B		210 B	230
Cyanide, Total										
Chlorine	0.02 U H	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U
Total Suspended Solids	4 U	4 U	4 U	4 U	4 U	4 U	4 U		4 U	4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
B - Compound was found in the
blank and sample
* - LCS or LCSD exceeds the
control limits
HF - Field parameter with a
holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
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Wilmington, Massachusetts

Parameter Name	IDW OC Frac 4. 071714 7/17/2014	IDW OC Frac 2. 072414 7/24/2014	IDW OC Frac 3. 072514 7/25/2014	IDW OC ST 2. 072514 7/25/2014	IDW OC FRAC 4. 073114 7/31/2014	IDW FRAC 5. 080114 8/1/2014	IDW FRAC 6. 080414 8/4/2014	IDW Frac 3 080714 8/7/2014	IDW OC-F1 081214 8/12/2014	IDW OC-F7 081214 8/12/2014	IDW OC FRAC 2. 081914 8/19/2014
VOCs (mg/L)											
Ethyl benzene											
1,4-Dichlorobenzene											
1,2-Dichloroethane											
2,4,4-Trimethyl-1-pentene											
2,4,4-Trimethyl-2-pentene											
Toluene											
Chlorobenzene											
1,4-Dioxane											
Tetrachloroethene											
Cis-1,2-Dichloroethene											
Methyl Tertbutyl Ether											
Xylenes (m&p)											
1,3-Dichlorobenzene											
Carbon tetrachloride											
Acetone											
Chloroform											
Benzene											
1,1,1-Trichloroethane											
Vinyl chloride											
Methylene chloride											
1,1-Dichloroethane											
1,1-Dichloroethene											
t-Butyl alcohol											
2-Butanone											
1,1,2-Trichloroethane											
Trichloroethene											
Naphthalene											
Xylene, o											
1,2-Dichlorobenzene											
Butane, 2-methoxy-2-methyl-											
Phenolics, Total Recoverable	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
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Parameter Name	IDW OC Frac 4. 071714 7/17/2014	IDW OC Frac 2. 072414 7/24/2014	IDW OC Frac 3. 072514 7/25/2014	IDW OC ST 2. 072514 7/25/2014	IDW OC FRAC 4. 073114 7/31/2014	IDW FRAC 5. 080114 8/1/2014	IDW FRAC 6. 080414 8/4/2014	IDW Frac 3 080714 8/7/2014	IDW OC-F1 081214 8/12/2014	IDW OC-F7 081214 8/12/2014	IDW OC FRAC 2. 081914 8/19/2014
SVOCs (mg/L)											
1,4-Dichlorobenzene											
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											
2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2-Chlorophenol											
2-Methylphenol											
2-Nitrophenol											
3 & 4 Methylphenol											
3-Methylphenol											
4,6-Dinitro-2-methylphenol											
4-Chloro-3-methylphenol											
4-Methylphenol											
4-Nitrophenol											
Acenaphthene											
Acenaphthylene											
Anthracene											
Benzo(a)anthracene											
Benzo(a)pyrene											
Benzo(b)fluoranthene											
Benzo(ghi)perylene											
Benzo(k)fluoranthene											
Bis(2-Ethylhexyl)phthalate	1.9 U	1.9 U	1.9 U	1.9 U	2.1	6.3	1.2 J	2.1	1.9 U	1.9 U	2.8
Butylbenzylphthalate	0.2 J	0.26 J	0.95 U	0.95 U	0.18 J	0.2 J	0.26 J	0.43 J	0.96 U	0.95 U	0.74 J
Chrysene											
Dibenz(a,h)anthracene											
Diethylphthalate	0.94 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U	0.95 U	0.95 U	0.96 U	0.95 U	0.95 U
Dimethylphthalate	0.94 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U	0.95 U	0.95 U	0.96 U	0.95 U	0.95 U
Di-n-butylphthalate	0.94 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U	0.95 U	0.95 U	0.96 U	0.95 U	0.95 U
Di-n-octylphthalate	0.94 U	0.95 U	0.95 U	0.95 U	0.94 U	0.95 U	0.95 U	0.95 U	0.96 U	0.95 U	0.95 U
Fluoranthene											
Fluorene											
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene											
Naphthalene											
Nitrobenzene											
Pentachlorophenol											
Phenanthrene											
Phenol											
Pyrene											
Pyridine											
1,2-Dibromoethane											

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Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC Frac 4. 071714 7/17/2014	IDW OC Frac 2. 072414 7/24/2014	IDW OC Frac 3. 072514 7/25/2014	IDW OC ST 2. 072514 7/25/2014	IDW OC FRAC 4. 073114 7/31/2014	IDW FRAC 5. 080114 8/1/2014	IDW FRAC 6. 080414 8/4/2014	IDW Frac 3 080714 8/7/2014	IDW OC-F1 081214 8/12/2014	IDW OC-F7 081214 8/12/2014	IDW OC FRAC 2. 081914 8/19/2014
TPH (mg/L)											
Total Petroleum Hydrocarbons											
PCBs (mg/L)											
Heptachlor epoxide											
Aroclor-1260											
Aroclor-1254											
Aroclor-1221											
Aroclor-1232											
Aroclor-1248											
Aroclor-1016											
Aroclor-1242											
Chlordane											
Gamma-BHC/Lindane											
Endrin											
Methoxychlor											
Heptachlor											
Toxaphene											
Herbicides (mg/L)											
2,4,5-TP/Silvex											
2,4-D											
Total Metals (mg/L)											
Chromium											
Chromium, Trivalent											
Chromium, Hexavalent											
Iron	50 U	50 U	13 J	50 U	50 U	200	50 U	10 J	25 J	43 J	50 U
Lead											
Mercury											
Nickel	10 U	0.56 J	2.5 J	10 U	2.9 J	0.89 J	10 U	10 U	10 U	10 U	0.77 J
Silver											
Antimony											
Arsenic	10 U	3.9 J	4 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Barium											
Cadmium											
Copper											
Zinc	7 J B	11 B	25 B	22 B	36 B	21 B	20 B	16	10 U	10 U	18
Selenium											
Inorganic Compounds (mg/L)											
Chloride	220	230 B	200	190	210	190	200	170	190 B	190 B	170
Cyanide, Total											
Chlorine	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U H	0.02 U H
Total Suspended Solids	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC FRAC 6. 082214 8/22/2014	IDW OC FRAC 3. 082614 8/26/2014	IDW OC FRAC 4. 082714 8/27/2014	IDW OC FRAC 5. 082814 8/28/2014	IDW FRAC1 090914 9/9/2014	IDW FRAC2 091014 9/10/2014	IDW FRAC 3 091214 9/12/2014	IDW FRAC 4 091714 9/17/2014	IDW FRAC 5 091814 9/18/2014	IDW Pre Treat 6 9/22/2014	IDW OC FRAC 1 092314 9/23/2014
VOCs (mg/L)											
Ethyl benzene											
1,4-Dichlorobenzene											
1,2-Dichloroethane											
2,4,4-Trimethyl-1-pentene											
2,4,4-Trimethyl-2-pentene											
Toluene											
Chlorobenzene											
1,4-Dioxane											
Tetrachloroethene											
Cis-1,2-Dichloroethene											
Methyl Tertbutyl Ether											
Xylenes (m&p)											
1,3-Dichlorobenzene											
Carbon tetrachloride											
Acetone											
Chloroform											
Benzene											
1,1,1-Trichloroethane											
Vinyl chloride											
Methylene chloride											
1,1-Dichloroethane											
1,1-Dichloroethene											
t-Butyl alcohol											
2-Butanone											
1,1,2-Trichloroethane											
Trichloroethene											
Naphthalene											
Xylene, o											
1,2-Dichlorobenzene											
Butane, 2-methoxy-2-methyl-											
Phenolics, Total Recoverable	0.01 U	0.005	0.005	0.005	0.0096 J	0.005 U	0.0065 J	0.005 U	0.005 U		0.005 U

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC FRAC 6. 082214 8/22/2014	IDW OC FRAC 3. 082614 8/26/2014	IDW OC FRAC 4. 082714 8/27/2014	IDW OC FRAC 5. 082814 8/28/2014	IDW FRAC1 090914 9/9/2014	IDW FRAC2 091014 9/10/2014	IDW FRAC 3 091214 9/12/2014	IDW FRAC 4 091714 9/17/2014	IDW FRAC 5 091814 9/18/2014	IDW Pre Treat 6 9/22/2014	IDW OC FRAC 1 092314 9/23/2014
SVOCs (mg/L)											
1,4-Dichlorobenzene											
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											
2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2-Chlorophenol											
2-Methylphenol											
2-Nitrophenol											
3 & 4 Methylphenol											
3-Methylphenol											
4,6-Dinitro-2-methylphenol											
4-Chloro-3-methylphenol											
4-Methylphenol											
4-Nitrophenol											
Acenaphthene											
Acenaphthylene											
Anthracene											
Benzo(a)anthracene											
Benzo(a)pyrene											
Benzo(b)fluoranthene											
Benzo(ghi)perylene											
Benzo(k)fluoranthene											
Bis(2-Ethylhexyl)phthalate	2.7	1.2	1.5	1.2	1.3 J	1.2 U	1.9 U	1.3 J	1.2 U		1.2 U
Butylbenzylphthalate	0.21 J	0.19	0.17	0.14	0.14 U	0.15 J	0.95 U	0.3 J	0.26 J		0.13 J
Chrysene											
Dibenz(a,h)anthracene											
Diethylphthalate	0.95 U	0.14	0.14	0.14	0.14 U	0.14 U	0.95 U	0.14 U	0.14 U		0.14 U
Dimethylphthalate	0.95 U	0.072	0.072	0.073	0.073 U	0.073 U	0.95 U	0.073 U	0.072 U		0.072 U
Di-n-butylphthalate	0.95 U	0.12	0.12	0.12	0.12 U	0.12 U	0.95 U	0.12 U	0.12 U		0.12 U
Di-n-octylphthalate	0.95 U	0.19	0.19	0.2	0.2 U	0.2 U	0.95 U	0.2 U	0.19 U		0.19 U
Fluoranthene											
Fluorene											
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene											
Naphthalene											
Nitrobenzene											
Pentachlorophenol											
Phenanthrene											
Phenol											
Pyrene											
Pyridine											
1,2-Dibromoethane											

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW OC FRAC 6. 082214 8/22/2014	IDW OC FRAC 3. 082614 8/26/2014	IDW OC FRAC 4. 082714 8/27/2014	IDW OC FRAC 5. 082814 8/28/2014	IDW FRAC1 090914 9/9/2014	IDW FRAC2 091014 9/10/2014	IDW FRAC 3 091214 9/12/2014	IDW FRAC 4 091714 9/17/2014	IDW FRAC 5 091814 9/18/2014	IDW Pre Treat 6 9/22/2014	IDW OC FRAC 1 092314 9/23/2014
TPH (mg/L)											
Total Petroleum Hydrocarbons											
PCBs (mg/L)											
Heptachlor epoxide											
Aroclor-1260											
Aroclor-1254											
Aroclor-1221											
Aroclor-1232											
Aroclor-1248											
Aroclor-1016											
Aroclor-1242											
Chlordane											
Gamma-BHC/Lindane											
Endrin											
Methoxychlor											
Heptachlor											
Toxaphene											
Herbicides (mg/L)											
2,4,5-TP/Silvex											
2,4-D											
Total Metals (mg/L)											
Chromium											
Chromium, Trivalent											
Chromium, Hexavalent											
Iron	50 U	9.5	9.5	9.5	9.5 U	9.5 U	2200	9.5 U	9.5 U	21 J	9.5 U
Lead											
Mercury											
Nickel	1 J	0.75	0.64	0.71	0.8 J	0.51 U	5.5 J	2.6 J	0.51 U	0.51 U	0.51 U
Silver											
Antimony											
Arsenic	10 U	3	3	3	3.1 J	3 U	10 U	3 U	3 U	3 U	3 U
Barium											
Cadmium											
Copper											
Zinc	19	13	17	12	21	11	140	23	14	1.5 J B	10
Selenium											
Inorganic Compounds (mg/L)											
Chloride	190 B	200	200	210	200 B	200 B	230 B	190 B	220 B		230 B
Cyanide, Total											
Chlorine	0.02 U	0.01	0.01	0.01	0.01 U HF	0.01 U HF	0.02 U HF	0.01 U HF	0.01 U HF		0.01 U HF
Total Suspended Solids	4 U	4	4	4	4 U	4 U	4 U	4 U	4 U		4 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
B - Compound was found in the
blank and sample
* - LCS or LCSD exceeds the
control limits
HF - Field parameter with a
holding time of 15 minutes
E - Exceeded the calibration range

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW FRAC2 092614 9/26/2014	Plant B Effluent Carbon Column A 4/11/2014	Plant B Effluent Carbon Column B 4/11/2014	Plant B Influent INF 041714 4/17/2014	Plant B Influent OC-INF 050814 5/8/2014	Plant B Influent INF 052714 5/27/2014	Plant B Influent OC- Inf 060414 6/4/2014	Plant B Influent OC INF. 061914 6/19/2014	Plant B Influent OC INF. 071714 7/17/2014	Plant B Influent OC INF. 082014 8/20/2014	Plant B Influent OC INF 092214 9/22/2014
VOCs (mg/L)											
Ethyl benzene					5 U						
1,4-Dichlorobenzene					5 U						
1,2-Dichloroethane		0.2 U	0.2 U		5 U						
2,4,4-Trimethyl-1-pentene					270						
2,4,4-Trimethyl-2-pentene					78						
Toluene					5 U						
Chlorobenzene		0.2 U	0.2 U								
1,4-Dioxane					250 U						
Tetrachloroethene		0.2 U	0.2 U		5 U						
Cis-1,2-Dichloroethene					5 U						
Methyl Tertbutyl Ether					5 U						
Xylenes (m&p)					10 U						
1,3-Dichlorobenzene					5 U						
Carbon tetrachloride		0.2 U	0.2 U		5 U						
Acetone					250 U						
Chloroform		0.2 U	0.2 U								
Benzene		0.2 U	0.2 U		5 U						
1,1,1-Trichloroethane					5 U						
Vinyl chloride		0.2 U	0.2 U		5 U						
Methylene chloride					5 U						
1,1-Dichloroethane					5 U						
1,1-Dichloroethene		0.2 U	0.2 U		5 U						
t-Butyl alcohol					250 U						
2-Butanone		0.2 U	0.2 U								
1,1,2-Trichloroethane					5 U						
Trichloroethene		0.2 U	0.2 U		5 U						
Naphthalene					25 U						
Xylene, o					5 U						
1,2-Dichlorobenzene					5 U						
Butane, 2-methoxy-2-methyl-					25 U						
Phenolics, Total Recoverable	0.005 U			0.012	0.0066 J	0.0077 J		0.027	0.012	0.0072 J	0.11 B

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW FRAC2 092614 9/26/2014	Plant B Effluent Carbon Column A 4/11/2014	Plant B Effluent Carbon Column B 4/11/2014	Plant B Influent INF 041714 4/17/2014	Plant B Influent OC-INF 050814 5/8/2014	Plant B Influent INF 052714 5/27/2014	Plant B Influent OC- Inf 060414 6/4/2014	Plant B Influent OC INF. 061914 6/19/2014	Plant B Influent OC INF. 071714 7/17/2014	Plant B Influent OC INF. 082014 8/20/2014	Plant B Influent OC INF 092214 9/22/2014
SVOCs (mg/L)											
1,4-Dichlorobenzene		0.05 U	0.05 U								
2,4,5-Trichlorophenol		0.05 U	0.05 U		240 U						
2,4,6-Trichlorophenol		0.05 U	0.05 U		240 U						
2,4-Dichlorophenol					24 U						
2,4-Dimethylphenol					47 U						
2,4-Dinitrophenol					240 U						
2,4-Dinitrotoluene		0.05 U	0.05 U								
2-Chlorophenol					240 U						
2-Methylphenol		0.05 U	0.05 U		47 U						
2-Nitrophenol					240 U						
3 & 4 Methylphenol					47 U						
3-Methylphenol					47 U						
4,6-Dinitro-2-methylphenol					240 U						
4-Chloro-3-methylphenol					240 U						
4-Methylphenol		0.05 U	0.05 U		47 U						
4-Nitrophenol					240 U *						
Acenaphthene					24 U						
Acenaphthylene					14 U						
Anthracene					24 U						
Benzo(a)anthracene					14 U						
Benzo(a)pyrene					8.5 U						
Benzo(b)fluoranthene					14 U						
Benzo(ghi)perylene					24 U						
Benzo(k)fluoranthene					14 U						
Bis(2-Ethylhexyl)phthalate	1.2 U			8	160 J	4.1		9.4	3.8	5.1	12
Butylbenzylphthalate	0.14 J			0.23 J	140 U	0.94 U		0.16 J	0.94 U	0.43 J	0.14 U
Chrysene					24 U						
Dibenz(a,h)anthracene					24 U						
Diethylphthalate	0.14 U			0.96 U	24 U	0.94 U		0.94 U	0.94 U	0.95 U	0.14 U
Dimethylphthalate	0.073 U			0.96 U	24 U	0.94 U		0.94 U	0.94 U	0.95 U	0.073 U
Di-n-butylphthalate	0.12 J			0.96 U	95 U	0.94 U		0.94 U	0.94 U	0.95 U	0.12 U
Di-n-octylphthalate	0.2 U			0.96 U	240 U	0.94 U		0.94 U	0.94 U	0.95 U	0.2 U
Fluoranthene					24 U						
Fluorene					24 U						
Hexachlorobenzene		0.05 U	0.05 U								
Hexachlorobutadiene		0.05 U	0.05 U								
Hexachloroethane		0.05 U	0.05 U								
Indeno(1,2,3-cd)pyrene					24 U						
Naphthalene					47 U						
Nitrobenzene		0.05 U	0.05 U								
Pentachlorophenol		0.25 U	0.25 U		47 U						
Phenanthrene					9.5 U						
Phenol					25 J						
Pyrene					24 U						
Pyridine		0.1 U	0.1 U								
1,2-Dibromoethane					0.011 U						

Table 3-1
Plant B Analytical Results for RGP Sampling (April 2014 - September 2014)
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	IDW FRAC2 092614 9/26/2014	Plant B Effluent Carbon Column A 4/11/2014	Plant B Effluent Carbon Column B 4/11/2014	Plant B Influent INF 041714 4/17/2014	Plant B Influent OC-INF 050814 5/8/2014	Plant B Influent INF 052714 5/27/2014	Plant B Influent OC- Inf 060414 6/4/2014	Plant B Influent OC INF. 061914 6/19/2014	Plant B Influent OC INF. 071714 7/17/2014	Plant B Influent OC INF. 082014 8/20/2014	Plant B Influent OC INF 092214 9/22/2014
TPH (mg/L)											
Total Petroleum Hydrocarbons					5.2		4.8 U				
PCBs (mg/L)											
Heptachlor epoxide		0.0005 U	0.0005 U								
Aroclor-1260					0.057 U						
Aroclor-1254					0.057 U						
Aroclor-1221					0.057 U						
Aroclor-1232					0.057 U						
Aroclor-1248					0.057 U						
Aroclor-1016					0.057 U						
Aroclor-1242					0.057 U						
Chlordane		0.005 U	0.005 U								
Gamma-BHC/Lindane		0.0005 U	0.0005 U								
Endrin		0.0005 U	0.0005 U								
Methoxychlor		0.001 U	0.001 U								
Heptachlor		0.0005 U	0.0005 U								
Toxaphene		0.02 U	0.02 U								
Herbicides (mg/L)											
2,4,5-TP/Silvex		0.01 U	0.01 U								
2,4-D		0.04 U	0.04 U								
Total Metals (mg/L)											
Chromium		0.5 U	0.5 U		0.004 U						
Chromium, Trivalent					0.01 U						
Chromium, Hexavalent					0.005 U						
Iron	9.5 U			4200	8.4	5000		6900	3800 B	11000	10000
Lead		0.5 U	0.5 U		0.005 U						
Mercury		0.0001 J B	0.000081 J B		0.0002 U						
Nickel	0.51 U			10 U	0.0024 J	1 J		10 U	0.78 J	0.93 J	1.9 J
Silver		0.5 U	0.5 U		0.003 U						
Antimony					0.02 U						
Arsenic	3 U	0.5 U	0.5 U	7.3 J	0.0099 J	8.8 J		10	8.6 J	15	14
Barium		0.11 J	0.064 J								
Cadmium		0.5 U	0.5 U		0.001 U						
Copper					0.0066 J B						
Zinc	17			7.7 J	0.0065 J	6.6 J		4.1 J	14 B	5.6 J	6.9 J B
Selenium		0.5 U	0.023 J		0.015 U						
Inorganic Compounds (mg/L)											
Chloride	240 B			110	170	200		220 B	90	180	230 B
Cyanide, Total					0.01 U						
Chlorine	0.01 U HF			0.02 U	0.02 U HF	0.02 U H		0.02 U	0.02 U	0.02 U	0.01 U HF
Total Suspended Solids	4 U			4 U	4 U	4 U		4 U	4 U	8.4	13

Notes:
mg/L - milligrams per liter
U - analyte not detected, value shown is detection limit
J - value is estimated
B - Compound was found in the blank and sample
* - LCS or LCSD exceeds the control limits
HF - Field parameter with a holding time of 15 minutes
E - Exceeded the calibration range

Created by / Date: KMS 12/12/14
Checked by / Date: CTM 12/30/14

Table 3-2
Plant B Analytical Results for Second Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-16R 5/29/2014
Volatile Organics (mg/L)	
2,4,4-Trimethyl-1-pentene	1.7
2,4,4-Trimethyl-2-pentene	0.65
Semivolatile Organics (mg/L)	
Bis(2-Ethylhexyl)phthalate	0.00075 J
N-Nitrosodiphenylamine	0.030 J
Metals, Filtered (mg/L)	
Iron	1.9
Inorganics (mg/L)	
Nitrogen, as Ammonia	3.9
pH	6.53 J
Volatile Petroleum Hydrocarbons (mg/L)	
Benzene	0.0027
C5-C8 Aliphatics	0.92
C5-C8 Aliphatics (unadj.)	0.95
C9-C10 Aromatics	0.022
C9-C12 Aliphatics	0.034
C9-C12 Aliphatics (unadj.)	0.059
Ethyl benzene	0.0032
Methyl Tertbutyl Ether	0.0018 U
Naphthalene	0.001 U
Toluene	0.025
Xylene, o	0.001 U
Xylenes (m&p)	0.002 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is reporting limit.
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/18/14

Table 3-3
Plant B Analytical Results for Third Quarter 2014 Groundwater Sampling
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter Name	OC-GW-16R 8/26/2014
Volatile Organics (mg/L)	
2,4,4-Trimethyl-1-pentene	1.6
2,4,4-Trimethyl-2-pentene	0.6
Semivolatile Organics (mg/L)	
Bis(2-Ethylhexyl)phthalate	0.0037
N-Nitrosodiphenylamine	0.036
Metals, Filtered (mg/L)	
Iron	2
Inorganics (mg/L)	
Nitrogen, as Ammonia	5
pH	6.65 J
Volatile Petroleum Hydrocarbons (mg/L)	
Benzene	0.05 U
C5-C8 Aliphatics	0.6
C5-C8 Aliphatics (unadj.)	0.63
C9-C10 Aromatics	0.25 U
C9-C12 Aliphatics	0.25 U
C9-C12 Aliphatics (unadj.)	0.25 U
Ethyl benzene	0.05 U
Methyl Tertbutyl Ether	0.05 U
Naphthalene	0.05 U
Toluene	0.05 U
Xylene, o	0.05 U
Xylenes (m&p)	0.1 U

Notes:
mg/L - milligrams per liter
U - analyte not detected,
value shown is reporting limit.
J - value is estimated

Prepared by / Date: KMS 12/8/14
Checked by / Date: LCG 12/18/14

Table 3-4
Plant B Water Level and Product Recovery Data: April 2014 - June2014 [1]
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Well	Depth to Water feet[2]			Depth to Product feet[2]			Product Thickness feet[3, 4]			Reference Elevation	Potentiometric Surface Elevation (feet NGVD) Corrected for Product [5]			Product Removed gallons		
ID	4/30/2014	5/31/2014	6/30/2014	4/30/2014	5/31/2014	6/30/2014	4/30/2014	5/31/2014	6/30/2014	feet	4/30/2014	5/31/2014	6/30/2014	4/30/2014	5/31/2014	6/30/2014
B-2	11.50	11.73	11.86	NPD	NPD	NPD	NA	NA	NA	90.48	78.98	78.75	78.62			
B-3	10.92	11.30	11.48	NPD	NPD	NPD	NA	NA	NA	90.32	79.40	79.02	78.84			
B-5R	10.91	11.58	11.82	NPD	NPD	NPD	NA	NA	NA	91.38	80.47	79.80	79.56			
B-7A	7.33	8.08	8.39	NPD	NPD	NPD	NA	NA	NA	88.81	81.48	80.73	80.42			
B-17	8.63	9.55	10.26	NPD	NPD	NPD	NA	NA	NA	91.55	82.92	82.00	81.29			
GW-13	11.20	11.47	11.73	NPD	NPD	NPD	NA	NA	NA	90.57	79.37	79.10	78.84			
GW-14	8.83	9.38	9.67	NPD	NPD	NPD	NA	NA	NA	88.70	79.87	79.32	79.03			
GW-15	7.92	8.86	9.27	NPD	NPD	NPD	NA	NA	NA	90.01	82.09	81.15	80.74			
GW-16R	10.00	10.88	11.32	NPD	NPD	NPD	NA	NA	NA	92.46	82.46	81.58	81.14			
GW-23	11.88	11.93	11.98	11.83	11.88	11.94	0.05	0.05	0.04	91.04	79.21	79.16	79.10			
GW-52S	8.02	9.80	9.18	NPD	NPD	NPD	NA	NA	NA	87.95	79.93	78.15	78.77			
GW-100	11.41	11.59	11.71	NPD	NPD	NPD	NA	NA	NA	90.15	78.74	78.56	78.44			
GW-101	11.50	11.67	11.78	NPD	NPD	NPD	NA	NA	NA	90.14	78.64	78.47	78.36			
GW-102	10.25	10.45	10.58	NPD	NPD	NPD	NA	NA	NA	89.00	78.75	78.55	78.42			
IW-1	11.41	11.82	11.96	NPD	NPD	NPD	NA	NA	NA	90.71	79.30	78.89	78.75			
IW-2	11.53	11.84	12.00	11.53	11.84	12.00	Trace	Trace	Trace	90.53	79.01	78.70	78.54			
IW-3	11.68	11.96	12.11	11.68	11.96	12.11	Trace	Trace	Trace	90.76	79.09	78.81	78.66			
IW-6	10.63	10.80	10.98	NPD	NPD	NPD	NA	NA	NA	89.15	78.52	78.35	78.17			
IW-7	11.52	11.73	11.88	NPD	NPD	NPD	NA	NA	NA	90.10	78.58	78.37	78.22			
IW-8	11.33	11.54	11.66	NPD	NPD	NPD	NA	NA	NA	89.94	78.61	78.40	78.28			
IW-9	11.01	11.25	11.37	NPD	NPD	NPD	NA	NA	NA	89.78	78.77	78.53	78.41			
IW-10	11.51	11.78	11.90	NPD	NPD	NPD	NA	NA	NA	90.43	78.92	78.65	78.53			
IW-11	13.68	13.78	13.77	13.65	13.76	13.75	0.03	0.02	0.02	89.92	76.27	76.16	76.17	0.52	0.21	0.22
IW-12	13.01	13.39	13.51	NPD	NPD	NPD	NA	NA	NA	90.31	77.30	76.92	76.80			
IW-13	19.38	19.38	19.38	19.38	19.38	19.38	Trace	Trace	Trace	89.90	70.53	70.53	70.53			
PID	11.41	11.61	11.78	11.41	11.61	11.78	Trace	Trace	Trace	89.97	78.57	78.37	78.20			
P5	11.58	11.82	12.02	11.58	11.82	12.02	Trace	Trace	Trace	90.45	78.88	78.64	78.44			
12-IN	10.79	10.97	11.25	10.79	10.97	11.25	Trace	Trace	Trace	89.84	79.06	78.88	78.60			
											Recovered Product For Month			0.52	0.21	0.22

Notes:
NPD - No Product Detected; NA - Not Applicable;
1 - Groundwater measurements and product recovery data collected by Olin
2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing
3 - Collected using ORS brand oil/water interface probe
4 - Sheens noted at wells are assigned a product thickness of 0.01 feet
5 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: LCG 6/3/2014
Checked by / Date: BJR 11/17/2014

Table 3-5
Plant B Water Level and Product Recovery Data: July 2014 -September 2014 [1]
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Well	Depth to Water feet[2]			Depth to Product feet[2]			Product Thickness feet[3, 4]			Reference Elevation	Potentiometric Surface Elevation (feet NGVD) Corrected for Product [5]			Product Removed gallons		
ID	7/31/2014	8/29/2014	10/1/2014	7/31/2014	8/29/2014	10/1/2014	7/31/2014	8/29/2014	10/1/2014	feet	7/31/2014	8/29/2014	10/1/2014	7/31/2014	8/29/2014	10/1/2014
B-2	11.80	11.83	11.85	NPD	NPD	NPD	NA	NA	NA	90.48	78.68	78.65	78.63			
B-3	11.36	11.40	11.42	NPD	NPD	NPD	NA	NA	NA	90.32	78.96	78.92	78.90			
B-5R	11.66	11.69	11.70	NPD	NPD	NPD	NA	NA	NA	91.38	79.72	79.69	79.68			
B-7A	8.19	8.23	8.22	NPD	NPD	NPD	NA	NA	NA	88.81	80.62	80.58	80.59			
B-17	10.11	10.18	10.17	NPD	NPD	NPD	NA	NA	NA	91.55	81.44	81.37	81.38			
GW-13	11.63	11.68	11.66	NPD	NPD	NPD	NA	NA	NA	90.57	78.94	78.89	78.91			
GW-14	9.40	9.44	9.47	NPD	NPD	NPD	NA	NA	NA	88.70	79.30	79.26	79.23			
GW-15	9.09	9.12	9.13	NPD	NPD	NPD	NA	NA	NA	90.01	80.92	80.89	80.88			
GW-16R	11.13	11.17	11.18	NPD	NPD	NPD	NA	NA	NA	92.46	81.33	81.29	81.28			
GW-23	11.87	11.89	11.90	11.83	11.84	11.86	0.04	0.05	0.04	91.04	79.21	79.20	79.18			
GW-52S	8.90	8.93	8.96	NPD	NPD	NPD	NA	NA	NA	87.95	79.05	79.02	78.99			
GW-100	11.68	11.71	11.75	NPD	NPD	NPD	NA	NA	NA	90.15	78.47	78.44	78.40			
GW-101	11.71	11.73	11.77	NPD	NPD	NPD	NA	NA	NA	90.14	78.43	78.41	78.37			
GW-102	10.50	10.52	10.55	NPD	NPD	NPD	NA	NA	NA	89.00	78.50	78.48	78.45			
IW-1	11.84	11.87	11.88	NPD	NPD	NPD	NA	NA	NA	90.71	78.87	78.84	78.83			
IW-2	11.89	11.92	11.94	11.89	11.92	11.94	Trace	Trace	Trace	90.53	78.65	78.62	78.60			
IW-3	12.01	12.05	12.04	12.01	12.05	12.04	Trace	Trace	Trace	90.76	78.76	78.72	78.73			
IW-6	10.91	10.96	10.97	NPD	NPD	NPD	NA	NA	NA	89.15	78.24	78.19	78.18			
IW-7	11.81	11.85	11.88	NPD	NPD	NPD	NA	NA	NA	90.10	78.29	78.25	78.22			
IW-8	11.58	11.63	11.65	NPD	NPD	NPD	NA	NA	NA	89.94	78.36	78.31	78.29			
IW-9	11.28	11.33	11.36	NPD	NPD	NPD	NA	NA	NA	89.78	78.50	78.45	78.42			
IW-10	11.84	11.87	11.89	NPD	NPD	NPD	NA	NA	NA	90.43	78.59	78.56	78.54			
IW-11	13.23	13.28	13.25	13.2	13.25	13.22	0.03	0.03	0.03	89.92	76.72	76.67	76.70	0.37	0.10	0.24
IW-12	13.47	13.50	13.53	NPD	NPD	NPD	NA	NA	NA	90.31	76.84	76.81	76.78			
IW-13	19.32	19.33	19.36	19.32	19.33	19.36	Trace	Trace	Trace	89.90	70.59	70.58	70.55			
PID	11.67	11.69	11.68	11.67	11.69	11.68	Trace	Trace	Trace	89.97	78.31	78.29	78.30			
P5	11.91	11.93	11.94	11.91	11.93	11.94	Trace	Trace	Trace	90.45	78.55	78.53	78.52			
12-IN	11.11	11.14	11.15	11.11	11.14	11.15	Trace	Trace	Trace	89.84	78.74	78.71	78.70			
											Recovered Product For Month			0.37	0.10	0.240

Notes:
NPD - No Product Detected; NA - Not Applicable
1 - Groundwater measurements and product recovery data collected by Olin
2 - Measurement collected from top of PVC; if well does not have PVC casing, measurement taken from top of steel casing
3 - Collected using ORS brand oil/water interface probe
4 - Sheens noted at wells are assigned a product thickness of 0.01 feet
5 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

Prepared by / Date: LCG 10/23/2014
Checked by / Date: BJR 11/17/2014

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M01L6C 5/21/2014	OC-M01L6D 5/21/2014	OC-M02L07 5/21/2014	OC-M03L02 5/21/2014	OC-M03L2D 5/21/2014	OC-M03L2F 5/21/2014	OC-M03L07 5/21/2014
Semivolatile Organics (ug/L)							
4-Nitroaniline			4.8 U				
4-Nitrophenol			4.8 UJ				
Benzyl alcohol			9.5 U				
Benzaldehyde			4.8 U				
4-Bromophenyl phenyl ether			4.8 U				
Diphenyl ether			4.8 UJ				
Azobenzene			4.8 U				
Caprolactam			4.8 U				
2,4-Dimethylphenol			4.8 U				
4-Methylphenol			4.8 U				
4-Chloroaniline			4.8 U				
2,2'-Dichlorodiisopropylether			4.8 U				
Phenol			4.8 U				
Bis(2-Chloroethyl)ether			4.8 U				
Bis(2-Chloroethoxy)methane			4.8 U				
Bis(2-Ethylhexyl)phthalate			16 J				
Di-n-octylphthalate			4.8 U				
Hexachlorobenzene			0.95 U				
Diphenylmethanone			4.8 U				
Anthracene			0.95 U				
2,4-Dichlorophenol			4.8 U				
2,4-Dinitrotoluene			4.8 U				
Pyrene			4.8 U				
Dimethylphthalate			4.8 U				
Dibenzofuran			4.8 U				
3 & 4 Methylphenol			4.8 U				
Benzo(ghi)perylene			0.48 UJ				
Atrazine			4.8 U				
Indeno(1,2,3-cd)pyrene			0.48 UJ				
Benzo(b)fluoranthene			0.29 U				
Fluoranthene			0.95 U				
Benzo(k)fluoranthene			0.29 U				
Acenaphthylene			0.29 U				
Chrysene			0.95 U				
Benzo(a)pyrene			0.19 U				
2,4-Dinitrophenol			4.8 U				
Dibenz(a,h)anthracene			0.48 UJ				
4,6-Dinitro-2-methylphenol			4.8 U				
Benzo(a)anthracene			0.29 U				
2,3,4,6-Tetrachlorophenol			4.8 U				
4-Chloro-3-methylphenol			4.8 U				
2,6-Dinitrotoluene			4.8 U				
Aniline			4.8 U				
N-Nitrosodi-n-propylamine			4.8 U				
Benzoic Acid			4.8 U				
Hexachloroethane			4.8 U				
4-Chlorophenyl phenyl ether			4.8 U				
Hexachlorocyclopentadiene			4.8 U				
Isophorone			4.8 U				
Acenaphthene			0.95 U				
Diethylphthalate			4.8 U				
Di-n-butylphthalate			0.73 J				
Phenanthrene			0.099 J				
Butylbenzylphthalate			4.8 U				
N-Nitrosodiphenylamine			4.8 U				

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M01L6C 5/21/2014	OC-M01L6D 5/21/2014	OC-M02L07 5/21/2014	OC-M03L02 5/21/2014	OC-M03L2D 5/21/2014	OC-M03L2F 5/21/2014	OC-M03L07 5/21/2014
Fluorene			0.95 U				
Carbazole			4.8 U				
Pentachlorophenol			0.95 U				
2,4,6-Trichlorophenol			4.8 U				
2-Nitroaniline			4.8 U				
Semivolatile Organics (ug/L)							
2-Nitrophenol			4.8 U				
1-Methylnaphthalene			4.8 U				
2-Methylnaphthalene			0.95 U				
2-Chloronaphthalene			4.8 U				
3,3'-Dichlorobenzidine			4.8 U				
Biphenyl			4.8 U				
2-Methylphenol			4.8 U				
1,2-Dichlorobenzene			4.8 U				
2-Chlorophenol			4.8 U				
1,2,4,5-Tetrachlorobenzene			4.8 U				
2,4,5-Trichlorophenol			4.8 U				
Acetophenone			4.8 U				
Nitrobenzene			4.8 U				
3-Nitroaniline			4.8 UJ				
NDMA/NDPA (ng/L)							
N-Nitrosodimethylamine	4	1.9 U	9.7	3.7	3.2	1.9 U	1.9 U
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (ug/L)							
Chromium			12				
Sodium			7600				
Hexavalent Chromium (mg/L)							
Chromium, Hexavalent			0.005 U				
Inorganics (mg/L)							
Nitrate as N			4.9				
Nitrite as N			0.05 U				
Chloride			14				
Nitrogen, as Ammonia			0.02 U				
Sulfate			20				

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M14L2B 5/21/2014	OC-M15L2C 5/20/2014	OC-M15L3A 5/22/2014	OC-M24L116 5/22/2014	OC-M24L54 5/20/2014	OC-M24L63 5/20/2014
Semivolatile Organics (ug/L)						
4-Nitroaniline		4.7 U			4.8 U	5 U
4-Nitrophenol		4.7 UJ			4.8 UJ	5 UJ
Benzyl alcohol		9.4 U			9.6 U	9.9 U
Benzaldehyde		4.7 U			4.8 U	5 U
4-Bromophenyl phenyl ether		4.7 U			4.8 U	5 U
Diphenyl ether		4.7 UJ			4.8 UJ	5 UJ
Azobenzene		4.7 U			4.8 U	5 U
Caprolactam		4.7 U			4.8 U	5 U
2,4-Dimethylphenol		4.7 U			4.8 U	5 U
4-Methylphenol		4.7 U			4.8 U	5 U
4-Chloroaniline		4.7 U			4.8 U	5 U
2,2'-Dichlorodiisopropylether		4.7 U			4.8 U	5 U
Phenol		4.7 U			4.8 U	5 U
Bis(2-Chloroethyl)ether		4.7 U			4.8 U	5 U
Bis(2-Chloroethoxy)methane		4.7 U			4.8 U	5 U
Bis(2-Ethylhexyl)phthalate		0.76 J			1.9 U	2 U
Di-n-octylphthalate		4.7 U			4.8 U	5 U
Hexachlorobenzene		0.94 U			0.96 U	0.99 U
Diphenylmethanone		4.7 U			4.8 U	5 U
Anthracene		0.94 U			0.96 U	0.99 U
2,4-Dichlorophenol		4.7 U			4.8 U	5 U
2,4-Dinitrotoluene		4.7 U			4.8 U	5 U
Pyrene		4.7 U			4.8 U	5 U
Dimethylphthalate		4.7 U			4.8 U	5 U
Dibenzofuran		4.7 U			4.8 U	5 U
3 & 4 Methylphenol		4.7 U			4.8 U	5 U
Benzo(ghi)perylene		0.47 UJ			0.48 UJ	0.5 UJ
Atrazine		4.7 U			4.8 U	5 U
Indeno(1,2,3-cd)pyrene		0.47 UJ			0.48 UJ	0.5 UJ
Benzo(b)fluoranthene		0.28 U			0.29 U	0.3 U
Fluoranthene		0.94 U			0.96 U	0.99 U
Benzo(k)fluoranthene		0.28 U			0.29 U	0.3 U
Acenaphthylene		0.28 U			0.29 U	0.3 U
Chrysene		0.94 U			0.96 U	0.99 U
Benzo(a)pyrene		0.19 U			0.19 U	0.2 U
2,4-Dinitrophenol		4.7 U			4.8 U	5 U
Dibenz(a,h)anthracene		0.47 UJ			0.48 UJ	0.5 UJ
4,6-Dinitro-2-methylphenol		4.7 U			4.8 U	5 U
Benzo(a)anthracene		0.28 U			0.29 U	0.3 U
2,3,4,6-Tetrachlorophenol		4.7 U			4.8 U	5 U
4-Chloro-3-methylphenol		4.7 U			4.8 U	5 U
2,6-Dinitrotoluene		4.7 U			4.8 U	5 U
Aniline		4.7 U			4.8 U	5 U
N-Nitrosodi-n-propylamine		4.7 U			4.8 U	5 U
Benzoic Acid		4.7 U			4.8 U	5 U
Hexachloroethane		4.7 U			4.8 U	5 U
4-Chlorophenyl phenyl ether		4.7 U			4.8 U	5 U
Hexachlorocyclopentadiene		4.7 U			4.8 U	5 U
Isophorone		4.7 U			4.8 U	5 U
Acenaphthene		0.94 U			0.96 U	0.99 U
Diethylphthalate		4.7 U			4.8 U	5 U
Di-n-butylphthalate		0.75 J			1 J	0.86 J
Phenanthrene		0.38 U			0.11 J	0.15 J
Butylbenzylphthalate		4.7 U			4.8 U	5 U
N-Nitrosodiphenylamine		4.7 U			4.8 U	5 U

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M14L2B 5/21/2014	OC-M15L2C 5/20/2014	OC-M15L3A 5/22/2014	OC-M24L116 5/22/2014	OC-M24L54 5/20/2014	OC-M24L63 5/20/2014
Fluorene		0.94 U			0.96 U	0.99 U
Carbazole		4.7 U			4.8 U	5 U
Pentachlorophenol		0.94 U			0.96 U	0.99 U
2,4,6-Trichlorophenol		4.7 U			4.8 U	5 U
2-Nitroaniline		4.7 U			4.8 U	5 U
Semivolatile Organics (ug/L)						
2-Nitrophenol		4.7 U			4.8 U	5 U
1-Methylnaphthalene		4.7 U			4.8 U	5 U
2-Methylnaphthalene		0.94 U			0.96 U	0.99 U
2-Chloronaphthalene		4.7 U			4.8 U	5 U
3,3'-Dichlorobenzidine		4.7 U			4.8 U	5 U
Biphenyl		4.7 U			4.8 U	5 U
2-Methylphenol		4.7 U			4.8 U	5 U
1,2-Dichlorobenzene		4.7 U			4.8 U	5 U
2-Chlorophenol		4.7 U			4.8 U	5 U
1,2,4,5-Tetrachlorobenzene		4.7 U			4.8 U	5 U
2,4,5-Trichlorophenol		4.7 U			4.8 U	5 U
Acetophenone		4.7 U			4.8 U	5 U
Nitrobenzene		4.7 U			4.8 U	5 U
3-Nitroaniline		4.7 UJ			4.8 UJ	5 UJ
NDMA/NDPA (ng/L)						
N-Nitrosodimethylamine	1.9 U	1.9 U	1.9 U	1.9 U	11	2
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U
Metals, Total (ug/L)						
Chromium	5 U	5 U			5 U	5 U
Sodium	28000	22000			28000	21000
Hexavalent Chromium (mg/L)						
Chromium, Hexavalent	0.005 U	0.005 U			0.005 U	0.005 U
Inorganics (mg/L)						
Nitrate as N	0.02 J	0.05 U			0.045 J	0.58
Nitrite as N	0.05 U	0.05 U			0.05 U	0.05 U
Chloride	13	110			77	120
Nitrogen, as Ammonia	0.02 U	0.02 U			0.02 UJ	0.02 U
Sulfate	76	31			26	21

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M24L64 5/20/2014	OC-M24L65 5/20/2014	OC-M24L66 5/20/2014	OC-M24L72A 5/20/2014	OC-M24L87 5/20/2014	OC-M24L94 5/20/2014	OC-M27L14C 5/20/2014
Semivolatile Organics (ug/L)							
4-Nitroaniline	4.8 U					4.8 U	4.9 U
4-Nitrophenol	4.8 UJ					4.8 UJ	4.9 UJ
Benzyl alcohol	9.6 U					9.6 U	9.8 U
Benzaldehyde	4.8 U					4.8 U	4.9 U
4-Bromophenyl phenyl ether	4.8 U					4.8 U	4.9 U
Diphenyl ether	4.8 UJ					4.8 UJ	4.9 UJ
Azobenzene	4.8 U					4.8 U	4.9 U
Caprolactam	4.8 U					4.8 U	4.9 U
2,4-Dimethylphenol	4.8 U					4.8 U	4.9 U
4-Methylphenol	4.8 U					4.8 U	4.9 U
4-Chloroaniline	4.8 U					4.8 U	4.9 U
2,2'-Dichlorodiisopropylether	4.8 U					4.8 U	4.9 U
Phenol	4.8 U					4.8 U	4.9 U
Bis(2-Chloroethyl)ether	4.8 U					4.8 U	4.9 U
Bis(2-Chloroethoxy)methane	4.8 U					4.8 U	4.9 U
Bis(2-Ethylhexyl)phthalate	1.9 U					1.9 U	2 U
Di-n-octylphthalate	4.8 U					4.8 U	4.9 U
Hexachlorobenzene	0.96 U					0.96 U	0.98 U
Diphenylmethanone	4.8 U					4.8 U	4.9 U
Anthracene	0.96 U					0.96 U	0.98 U
2,4-Dichlorophenol	4.8 U					4.8 U	4.9 U
2,4-Dinitrotoluene	4.8 U					4.8 U	4.9 U
Pyrene	4.8 U					4.8 U	4.9 U
Dimethylphthalate	4.8 U					4.8 U	4.9 U
Dibenzofuran	4.8 U					4.8 U	4.9 U
3 & 4 Methylphenol	4.8 U					4.8 U	4.9 U
Benzo(ghi)perylene	0.48 UJ					0.48 UJ	0.49 UJ
Atrazine	4.8 U					4.8 U	4.9 U
Indeno(1,2,3-cd)pyrene	0.48 UJ					0.48 UJ	0.49 UJ
Benzo(b)fluoranthene	0.29 U					0.29 U	0.29 U
Fluoranthene	0.96 U					0.96 U	0.98 U
Benzo(k)fluoranthene	0.29 U					0.29 U	0.29 U
Acenaphthylene	0.29 U					0.29 U	0.29 U
Chrysene	0.96 U					0.96 U	0.98 U
Benzo(a)pyrene	0.19 U					0.19 U	0.2 U
2,4-Dinitrophenol	4.8 U					4.8 U	4.9 U
Dibenz(a,h)anthracene	0.48 UJ					0.48 UJ	0.49 UJ
4,6-Dinitro-2-methylphenol	4.8 U					4.8 U	4.9 U
Benzo(a)anthracene	0.29 U					0.29 U	0.29 U
2,3,4,6-Tetrachlorophenol	4.8 U					4.8 U	4.9 U
4-Chloro-3-methylphenol	4.8 U					4.8 U	4.9 U
2,6-Dinitrotoluene	4.8 U					4.8 U	4.9 U
Aniline	4.8 U					4.8 U	4.9 U
N-Nitrosodi-n-propylamine	4.8 U					4.8 U	4.9 U
Benzoic Acid	4.8 U					4.8 U	4.9 U
Hexachloroethane	4.8 U					4.8 U	4.9 U
4-Chlorophenyl phenyl ether	4.8 U					4.8 U	4.9 U
Hexachlorocyclopentadiene	4.8 U					4.8 U	4.9 U
Isophorone	4.8 U					4.8 U	4.9 U
Acenaphthene	0.96 U					0.96 U	0.98 U
Diethylphthalate	4.8 U					4.8 U	4.9 U
Di-n-butylphthalate	0.53 J					0.57 J	1.6 J
Phenanthrene	0.39 U					0.39 U	0.39 U
Butylbenzylphthalate	4.8 U					4.8 U	4.9 U
N-Nitrosodiphenylamine	4.8 U					4.8 U	4.9 U

Table 5-1
Private Well Analytical Results for the Second Quarter 2014
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M24L64 5/20/2014	OC-M24L65 5/20/2014	OC-M24L66 5/20/2014	OC-M24L72A 5/20/2014	OC-M24L87 5/20/2014	OC-M24L94 5/20/2014	OC-M27L14C 5/20/2014
Fluorene	0.96 U					0.96 U	0.98 U
Carbazole	4.8 U					4.8 U	4.9 U
Pentachlorophenol	0.96 U					0.96 U	0.98 U
2,4,6-Trichlorophenol	4.8 U					4.8 U	4.9 U
2-Nitroaniline	4.8 U					4.8 U	4.9 U
Semivolatile Organics (ug/L)							
2-Nitrophenol	4.8 U					4.8 U	4.9 U
1-Methylnaphthalene	4.8 U					4.8 U	4.9 U
2-Methylnaphthalene	0.96 U					0.96 U	0.98 U
2-Chloronaphthalene	4.8 U					4.8 U	4.9 U
3,3'-Dichlorobenzidine	4.8 U					4.8 U	4.9 U
Biphenyl	4.8 U					4.8 U	4.9 U
2-Methylphenol	4.8 U					4.8 U	4.9 U
1,2-Dichlorobenzene	4.8 U					4.8 U	4.9 U
2-Chlorophenol	4.8 U					4.8 U	4.9 U
1,2,4,5-Tetrachlorobenzene	4.8 U					4.8 U	4.9 U
2,4,5-Trichlorophenol	4.8 U					4.8 U	4.9 U
Acetophenone	4.8 U					4.8 U	4.9 U
Nitrobenzene	4.8 U					4.8 U	4.9 U
3-Nitroaniline	4.8 UJ					4.8 UJ	4.9 UJ
NDMA/NDPA (ng/L)							
N-Nitrosodimethylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.51 J	1 J
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (ug/L)							
Chromium	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Sodium	20000	16000	4300	13000	23000	76000	24000
Hexavalent Chromium (mg/L)							
Chromium, Hexavalent	0.005 U				0.005 U	0.005 U	0.005 U
Inorganics (mg/L)							
Nitrate as N	0.69	0.48	0.029 J	0.29	0.26	2.2	0.79
Nitrite as N	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloride	110	99	4.1	70	120	170	110
Nitrogen, as Ammonia	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Sulfate	20	22	12	29	18	18	36

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated

Prepared by / Date: KMS 12/30/14
Checked by / Date: LCG 12/30/2014

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M01L6C 9/10/2014	OC-M01L6D 9/11/2014	OC-M02L07 8/5/2014	OC-M03L02 9/10/2014	OC-M03L2D 9/10/2014	OC-M03L2F 9/10/2014	OC-M03L07 9/11/2014	OC-M14L2B 9/10/2014
Semivolatile Organics (ug/L)								
4-Nitroaniline			1.9 U					
4-Nitrophenol			4.8 U					
Benzyl alcohol			4.8 U					
Benzaldehyde			0.95 U					
4-Bromophenyl phenyl ether			1.9 U					
Diphenyl ether			9.5 U					
Azobenzene			9.5 U					
Caprolactam			4.8 U					
2,4-Dimethylphenol			1.9 U					
4-Chloroaniline			1.9 U					
2,2'-Dichlorodiisopropylether			0.95 U					
Phenol			0.95 U					
Bis(2-Chloroethyl)ether			0.95 U					
Bis(2-Chloroethoxy)methane			0.95 U					
Bis(2-Ethylhexyl)phthalate			2.7 J					
Di-n-octylphthalate			1.9 U					
Hexachlorobenzene			0.19 U					
Diphenylmethanone			4.8 U					
Anthracene			0.19 U					
2,4-Dichlorophenol			1.9 U					
2,4-Dinitrotoluene			4.8 U					
Pyrene			0.19 U					
Dimethylphthalate			1.9 U					
Dibenzofuran			0.95 U					
3 & 4 Methylphenol			1.9 U					
Benzo(ghi)perylene			0.19 U					
Atrazine			0.95 U					
Indeno(1,2,3-cd)pyrene			0.19 U					
Benzo(b)fluoranthene			0.19 U					
Fluoranthene			0.19 U					
Benzo(k)fluoranthene			0.19 U					
Acenaphthylene			0.19 U					
Chrysene			0.19 U					
Benzo(a)pyrene			0.19 U					
2,4-Dinitrophenol			4.8 U					
Dibenz(a,h)anthracene			0.19 U					
4,6-Dinitro-2-methylphenol			4.8 U					
Benzo(a)anthracene			0.19 U					
2,3,4,6-Tetrachlorophenol			9.5 U					
4-Chloro-3-methylphenol			1.9 U					
2,6-Dinitrotoluene			4.8 U					
Aniline			4.8 U					
N-Nitrosodi-n-propylamine			0.95 U					
Benzoic Acid			24 UJ					
Hexachloroethane			0.95 U					
4-Chlorophenyl phenyl ether			1.9 U					
Hexachlorocyclopentadiene			9.5 U					
Isophorone			0.95 U					
Acenaphthene			0.19 U					
Diethylphthalate			1.9 U					
Di-n-butylphthalate			4.8 U					
Phenanthrene			0.19 U					
Butylbenzylphthalate			1.9 U					
N-Nitrosodiphenylamine			0.95 U					
Fluorene			0.19 U					

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
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Parameter	OC-M01L6C 9/10/2014	OC-M01L6D 9/11/2014	OC-M02L07 8/5/2014	OC-M03L02 9/10/2014	OC-M03L2D 9/10/2014	OC-M03L2F 9/10/2014	OC-M03L07 9/11/2014	OC-M14L2B 9/10/2014
Carbazole			0.95 U					
Pentachlorophenol			4.8 U					
2,4,6-Trichlorophenol			4.8 U					
2-Nitroaniline			1.9 U					
2-Nitrophenol			1.9 U					
Semivolatile Organics (ug/L)								
1-Methylnaphthalene			0.19 U					
2-Methylnaphthalene			0.19 U					
2-Chloronaphthalene			0.19 U					
3,3'-Dichlorobenzidine			4.8 U					
Biphenyl			0.95 U					
2-Methylphenol			0.95 U					
1,2-Dichlorobenzene			0.95 U					
2-Chlorophenol			0.95 U					
1,2,4,5-Tetrachlorobenzene			0.95 U					
2,4,5-Trichlorophenol			4.8 U					
Acetophenone			0.95 U					
Nitrobenzene			0.95 U					
3-Nitroaniline			1.9 U					
NDMA/NDPA (ng/L)								
N-Nitrosodimethylamine	2.3 J	1.9 U	1.9 U	3.3 J	2.3 J	1.9 U	1.9 U	1.9 U
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2
Metals, Total (ug/L)								
Chromium			5 U					5 U
Sodium			8900					21000
hexavalent Chromium (mg/L)								
Chromium, Hexavalent			0.005 U					0.005 U
Inorganics (mg/L)								
Nitrate as N			6.9					0.05 U
Nitrite as N			0.05 U					0.05 U
Chloride			22					14
Nitrogen, as Ammonia			0.02 U					0.02 U
Sulfate			17					49

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
R - value is rejected

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
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Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-M15L2C 9/10/2014	OC-M24L116 9/10/2014	OC-M24L54 9/10/2014	OC-M24L63 9/10/2014	OC-M24L64 9/10/2014	OC-M24L65 9/10/2014	OC-M24L66 9/10/2014	OC-M24L72A 9/10/2014
Semivolatile Organics (ug/L)								
4-Nitroaniline	1.9 U		1.9 U	1.9 UJ	1.9 U			
4-Nitrophenol	4.8 U		4.8 U	4.8 UJ	4.8 U			
Benzyl alcohol	4.8 U		4.8 U	4.8 UJ	4.8 U			
Benzaldehyde	0.95 U		0.95 U	0.95 UJ	0.95 U			
4-Bromophenyl phenyl ether	1.9 U		1.9 U	1.9 UJ	1.9 U			
Diphenyl ether	9.5 U		9.5 U	9.5 UJ	9.5 U			
Azobenzene	9.5 U		9.5 U	9.5 UJ	9.5 U			
Caprolactam	4.8 UJ		4.8 UJ	4.8 UJ	4.8 UJ			
2,4-Dimethylphenol	1.9 U		1.9 U	1.9 UJ	1.9 U			
4-Chloroaniline	1.9 U		1.9 U	1.9 UJ	1.9 U			
2,2'-Dichlorodiisopropylether	0.95 U		0.95 U	0.95 UJ	0.95 U			
Phenol	0.95 U		0.95 U	0.95 UJ	0.95 U			
Bis(2-Chloroethyl)ether	0.95 U		0.95 U	0.95 UJ	0.95 U			
Bis(2-Chloroethoxy)methane	0.95 U		0.95 U	0.95 UJ	0.95 U			
Bis(2-Ethylhexyl)phthalate	1.9 J		4.8 U	1.9 J	2.1 J			
Di-n-octylphthalate	1.9 U		1.9 U	1.9 UJ	1.9 U			
Hexachlorobenzene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Diphenylmethanone	4.8 U		4.8 U	4.8 UJ	4.8 U			
Anthracene	0.19 U		0.19 U	0.19 UJ	0.19 U			
2,4-Dichlorophenol	1.9 U		1.9 U	1.9 UJ	1.9 U			
2,4-Dinitrotoluene	4.8 U		4.8 U	4.8 UJ	4.8 U			
Pyrene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Dimethylphthalate	1.9 U		1.9 U	1.9 UJ	1.9 U			
Dibenzofuran	0.95 U		0.95 U	0.95 UJ	0.95 U			
3 & 4 Methylphenol	1.9 U		1.9 U	1.9 UJ	1.9 U			
Benzo(ghi)perylene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Atrazine	0.95 U		0.95 U	0.95 UJ	0.95 U			
Indeno(1,2,3-cd)pyrene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Benzo(b)fluoranthene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Fluoranthene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Benzo(k)fluoranthene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Acenaphthylene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Chrysene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Benzo(a)pyrene	0.19 U		0.19 U	0.19 UJ	0.19 U			
2,4-Dinitrophenol	4.8 U		4.8 U	4.8 UJ	4.8 U			
Dibenz(a,h)anthracene	0.19 U		0.19 U	0.19 UJ	0.19 U			
4,6-Dinitro-2-methylphenol	4.8 UJ		4.8 UJ	4.8 UJ	4.8 UJ			
Benzo(a)anthracene	0.19 U		0.19 U	0.19 UJ	0.19 U			
2,3,4,6-Tetrachlorophenol	9.5 U		9.5 U	9.5 UJ	9.5 U			
4-Chloro-3-methylphenol	1.9 U		1.9 U	1.9 UJ	1.9 U			
2,6-Dinitrotoluene	4.8 U		4.8 U	4.8 UJ	4.8 U			
Aniline	4.8 U		4.8 U	4.8 UJ	4.8 U			
N-Nitrosodi-n-propylamine	0.95 U		0.95 U	0.95 UJ	0.95 U			
Benzoic Acid	R		R	R	R			
Hexachloroethane	0.95 U		0.95 U	0.95 UJ	0.95 U			
4-Chlorophenyl phenyl ether	1.9 U		1.9 U	1.9 UJ	1.9 U			
Hexachlorocyclopentadiene	9.5 UJ		9.5 UJ	9.5 UJ	9.5 UJ			
Isophorone	0.95 U		0.95 U	0.95 UJ	0.95 U			
Acenaphthene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Diethylphthalate	1.9 U		1.9 U	1.9 UJ	1.9 U			
Di-n-butylphthalate	4.8 U		4.8 U	4.8 UJ	4.8 U			
Phenanthrene	0.19 U		0.19 U	0.19 UJ	0.19 U			
Butylbenzylphthalate	1.9 U		1.9 U	1.9 UJ	1.9 U			
N-Nitrosodiphenylamine	0.95 U		0.95 U	0.95 UJ	0.95 U			
Fluorene	0.19 U		0.19 U	0.19 UJ	0.19 U			

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
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Wilmington, Massachusetts

Parameter	OC-M15L2C 9/10/2014	OC-M24L116 9/10/2014	OC-M24L54 9/10/2014	OC-M24L63 9/10/2014	OC-M24L64 9/10/2014	OC-M24L65 9/10/2014	OC-M24L66 9/10/2014	OC-M24L72A 9/10/2014
Carbazole	0.95 U		0.95 U	0.95 UJ	0.95 U			
Pentachlorophenol	4.8 U		4.8 U	4.8 UJ	4.8 U			
2,4,6-Trichlorophenol	4.8 U		4.8 U	4.8 UJ	4.8 U			
2-Nitroaniline	1.9 U		1.9 U	1.9 UJ	1.9 U			
2-Nitrophenol	1.9 U		1.9 U	1.9 UJ	1.9 U			
Semivolatile Organics (ug/L)								
1-Methylnaphthalene	0.19 U		0.19 U	0.19 UJ	0.19 U			
2-Methylnaphthalene	0.19 U		0.19 U	0.19 UJ	0.19 U			
2-Chloronaphthalene	0.95 U		0.95 U	0.95 UJ	0.95 U			
3,3'-Dichlorobenzidine	4.8 U		4.8 U	4.8 UJ	4.8 U			
Biphenyl	0.95 U		0.95 U	0.95 UJ	0.95 U			
2-Methylphenol	0.95 U		0.95 U	0.95 UJ	0.95 U			
1,2-Dichlorobenzene	0.95 U		0.95 U	0.95 UJ	0.95 U			
2-Chlorophenol	0.95 U		0.95 U	0.95 UJ	0.95 U			
1,2,4,5-Tetrachlorobenzene	0.95 U		0.95 U	0.95 UJ	0.95 U			
2,4,5-Trichlorophenol	4.8 U		4.8 U	4.8 UJ	4.8 U			
Acetophenone	0.95 U		0.95 U	0.95 UJ	0.95 U			
Nitrobenzene	0.95 U		0.95 U	0.95 UJ	0.95 U			
3-Nitroaniline	1.9 U		1.9 U	1.9 UJ	1.9 U			
NDMA/NDPA (ng/L)								
N-Nitrosodimethylamine	1.9 U	1.9 U	12	1.9 U	1.9 U	1.9 U	1.9 U	2.7 J
N-Nitrosodi-n-propylamine	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Metals, Total (ug/L)								
Chromium	5 U		5 U	5 U	5 U	5 U	5 U	5 U
Sodium	19000		27000	19000	19000	16000	26000	18000
hexavalent Chromium (mg/L)								
Chromium, Hexavalent	0.005 U		0.005 U	0.005 U	0.005 U			
Inorganics (mg/L)								
Nitrate as N	0.023 J		0.057	0.49	0.45	0.49	0.26	0.42
Nitrite as N	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloride	99		72	110	120	96	130	97
Nitrogen, as Ammonia	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Sulfate	28		24	19	19	19	17	18

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
R - value is rejected

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Parameter	OC-24L94 9/10/2014	OC-M27L14C 9/10/2014
Semivolatile Organics (ug/L)		
4-Nitroaniline	1.9 UJ	1.9 UJ
4-Nitrophenol	4.8 UJ	4.8 UJ
Benzyl alcohol	4.8 UJ	4.8 UJ
Benzaldehyde	0.95 UJ	0.95 UJ
4-Bromophenyl phenyl ether	1.9 UJ	1.9 UJ
Diphenyl ether	9.5 UJ	9.5 UJ
Azobenzene	9.5 UJ	9.5 UJ
Caprolactam	4.8 UJ	4.8 UJ
2,4-Dimethylphenol	1.9 UJ	1.9 UJ
4-Chloroaniline	1.9 UJ	1.9 UJ
2,2'-Dichlorodiisopropylether	0.95 UJ	0.95 UJ
Phenol	0.95 UJ	0.95 UJ
Bis(2-Chloroethyl)ether	0.95 UJ	0.95 UJ
Bis(2-Chloroethoxy)methane	0.95 UJ	0.95 UJ
Bis(2-Ethylhexyl)phthalate	4.8 UJ	4.8 UJ
Di-n-octylphthalate	1.9 UJ	1.9 UJ
Hexachlorobenzene	0.19 UJ	0.19 UJ
Diphenylmethanone	4.8 UJ	4.8 UJ
Anthracene	0.19 UJ	0.19 UJ
2,4-Dichlorophenol	1.9 UJ	1.9 UJ
2,4-Dinitrotoluene	4.8 UJ	4.8 UJ
Pyrene	0.19 UJ	0.19 UJ
Dimethylphthalate	1.9 UJ	1.9 UJ
Dibenzofuran	0.95 UJ	0.95 UJ
3 & 4 Methylphenol	1.9 UJ	1.9 UJ
Benzo(ghi)perylene	0.19 UJ	0.19 UJ
Atrazine	0.95 UJ	0.95 UJ
Indeno(1,2,3-cd)pyrene	0.19 UJ	0.19 UJ
Benzo(b)fluoranthene	0.19 UJ	0.19 UJ
Fluoranthene	0.19 UJ	0.19 UJ
Benzo(k)fluoranthene	0.19 UJ	0.19 UJ
Acenaphthylene	0.19 UJ	0.19 UJ
Chrysene	0.19 UJ	0.19 UJ
Benzo(a)pyrene	0.19 UJ	0.19 UJ
2,4-Dinitrophenol	4.8 UJ	4.8 UJ
Dibenz(a,h)anthracene	0.19 UJ	0.19 UJ
4,6-Dinitro-2-methylphenol	4.8 UJ	4.8 UJ
Benzo(a)anthracene	0.19 UJ	0.19 UJ
2,3,4,6-Tetrachlorophenol	9.5 UJ	9.5 UJ
4-Chloro-3-methylphenol	1.9 UJ	1.9 UJ
2,6-Dinitrotoluene	4.8 UJ	4.8 UJ
Aniline	4.8 UJ	4.8 UJ
N-Nitrosodi-n-propylamine	0.95 UJ	0.95 UJ
Benzoic Acid	R	R
Hexachloroethane	0.95 UJ	0.95 UJ
4-Chlorophenyl phenyl ether	1.9 UJ	1.9 UJ
Hexachlorocyclopentadiene	9.5 UJ	9.5 UJ
Isophorone	0.95 UJ	0.95 UJ
Acenaphthene	0.19 UJ	0.19 UJ
Diethylphthalate	1.9 UJ	1.9 UJ
Di-n-butylphthalate	4.8 UJ	4.8 UJ
Phenanthrene	0.19 UJ	0.19 UJ
Butylbenzylphthalate	1.9 UJ	1.9 UJ
N-Nitrosodiphenylamine	0.95 UJ	0.95 UJ
Fluorene	0.19 UJ	0.19 UJ

Table 5-2
Private Well Analytical Results for the Third Quarter 2014
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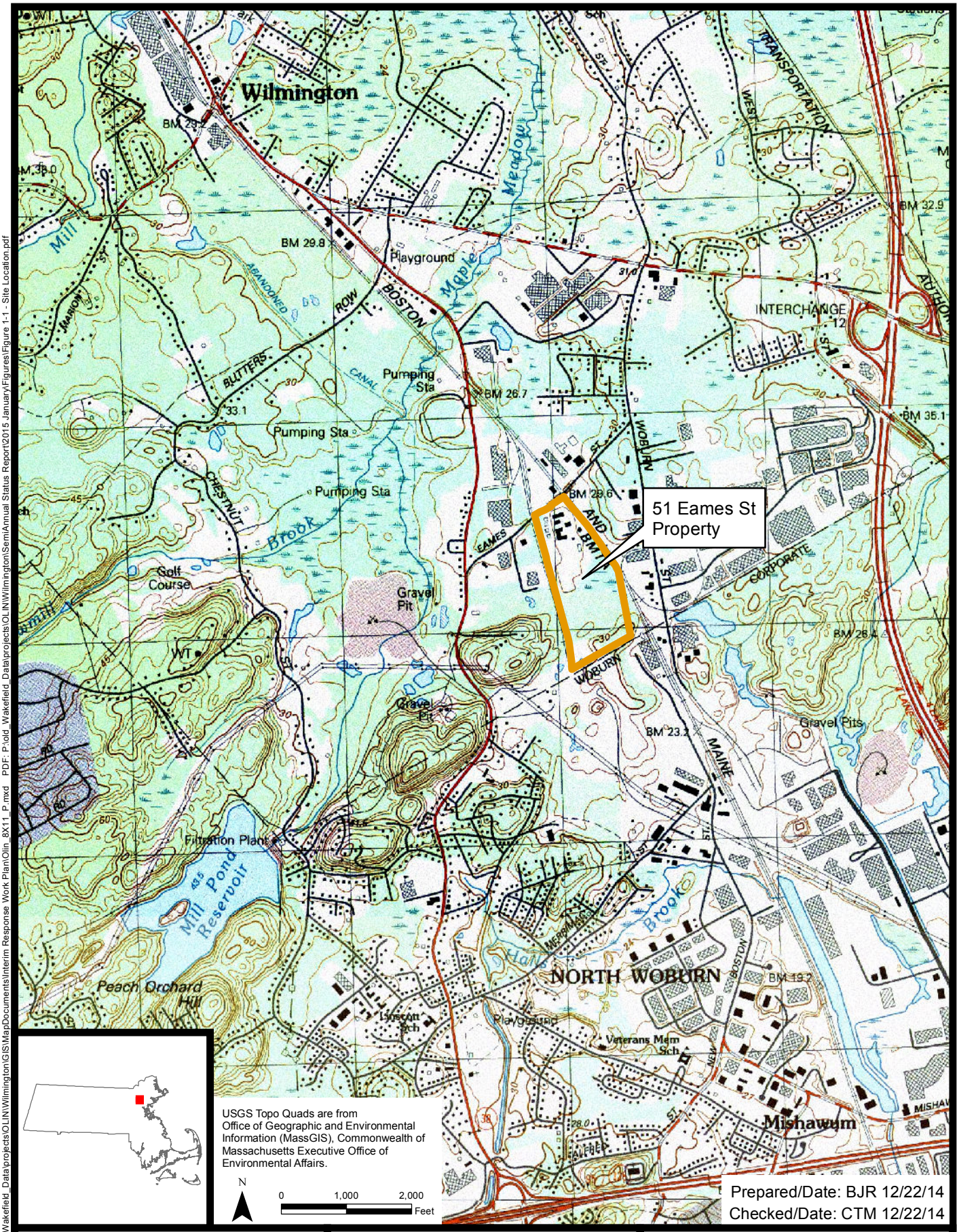
Parameter	OC-24L94 9/10/2014	OC-M27L14C 9/10/2014
Carbazole	0.95 UJ	0.95 UJ
Pentachlorophenol	4.8 UJ	4.8 UJ
2,4,6-Trichlorophenol	4.8 UJ	4.8 UJ
2-Nitroaniline	1.9 UJ	1.9 UJ
2-Nitrophenol	1.9 UJ	1.9 UJ
Semivolatile Organics (ug/L)		
1-Methylnaphthalene	0.19 UJ	0.19 UJ
2-Methylnaphthalene	0.19 UJ	0.19 UJ
2-Chloronaphthalene	0.95 UJ	0.95 UJ
3,3'-Dichlorobenzidine	4.8 UJ	4.8 UJ
Biphenyl	0.95 UJ	0.95 UJ
2-Methylphenol	0.95 UJ	0.95 UJ
1,2-Dichlorobenzene	0.95 UJ	0.95 UJ
2-Chlorophenol	0.95 UJ	0.95 UJ
1,2,4,5-Tetrachlorobenzene	0.95 UJ	0.95 UJ
2,4,5-Trichlorophenol	4.8 UJ	4.8 UJ
Acetophenone	0.95 UJ	0.95 UJ
Nitrobenzene	0.95 UJ	0.95 UJ
3-Nitroaniline	1.9 UJ	1.9 UJ
NDMA/NDPA (ng/L)		
N-Nitrosodimethylamine	8.9	1.9 U
N-Nitrosodi-n-propylamine	1.9 U	1.9 U
Metals, Total (ug/L)		
Chromium	5 U	5 U
Sodium	61000	29000
hexavalent Chromium (mg/L)		
Chromium, Hexavalent	0.005 U	0.005 U
Inorganics (mg/L)		
Nitrate as N	1.1	0.065
Nitrite as N	0.05 U	0.05 U
Chloride	180	100
Nitrogen, as Ammonia	0.02 U	0.02 U
Sulfate	20	35

Notes:
mg/L - milligram per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
U - analyte not detected,
value shown is detection limit
J - value is estimated
R - value is rejected

Prepared by / Date: KMS 12/30/14
Checked by / Date: CTM 12/31/14

FIGURES



Olin Chemical Superfund Site
Wilmington, Massachusetts

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Figure 1-1
Site Location
Semi-Annual Status Report No. 15

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_8X11_P.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Figures\Figure 1-1 - Site Location.pdf

Legend

- Railroad
- Water
- Culvert
- Site Boundary

AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

N

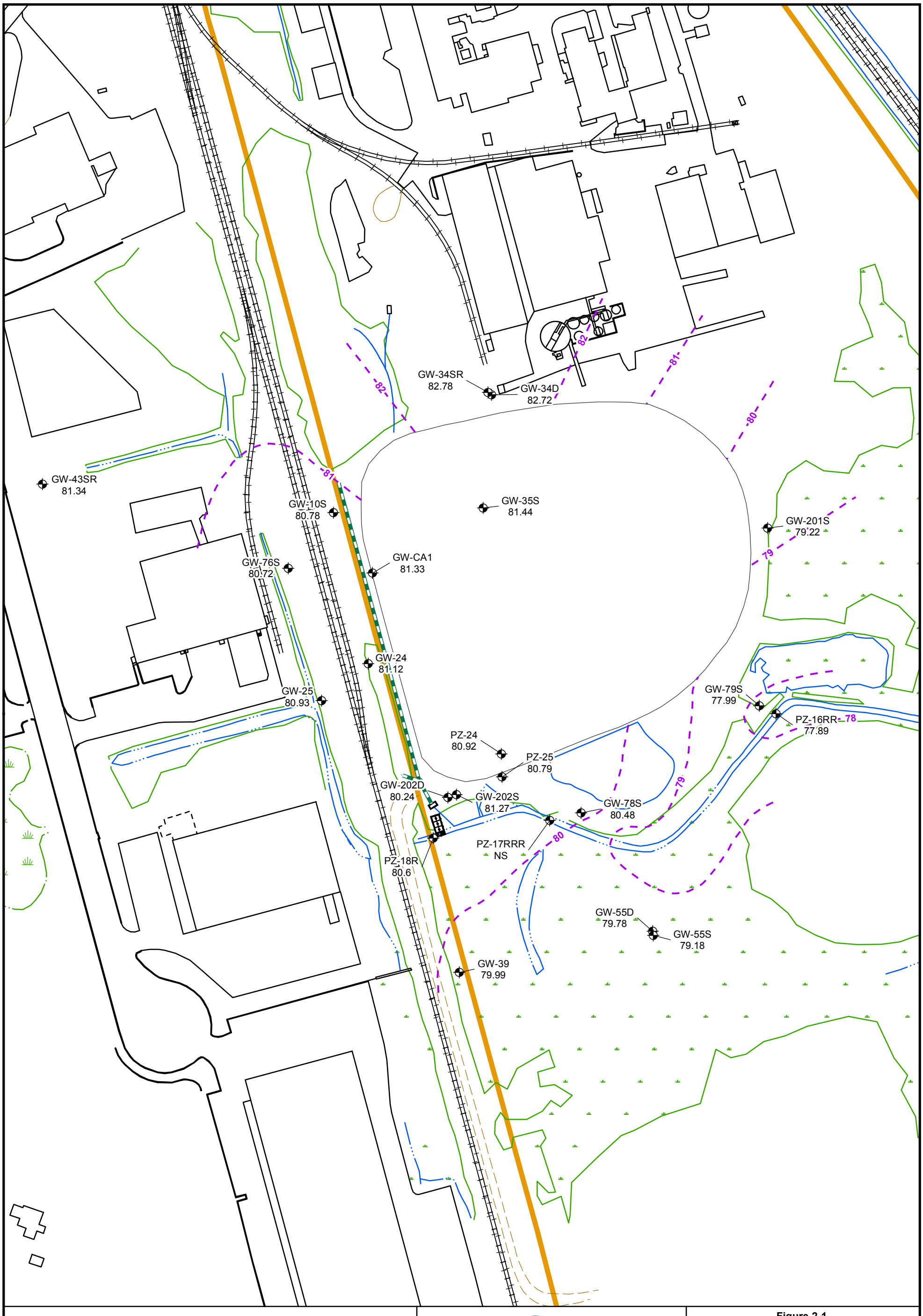
0 100 200 400 Feet

Figure 1-2
Site Plan

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: CTM 12/22/14

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Figures\Figure 1-2 - Site Plan.pdff



Legend

- Interpreted Groundwater Contour
- Site Boundary
- Wetland Boundary
- NS - Not Surveyed
- Paved Road
- Unpaved Road
- Railroad
- Structure
- Water
- Culvert
- Trail

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N

0 60 120 240 Feet

Figure 2-1
Slurry Wall / Cap Interpreted Water Level Contours - Second Quarter 2014

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Olin Chemical Superfund Site
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Prepared/Date: BJR 12/29/14 | Checked/Date: CTM 12/29/14

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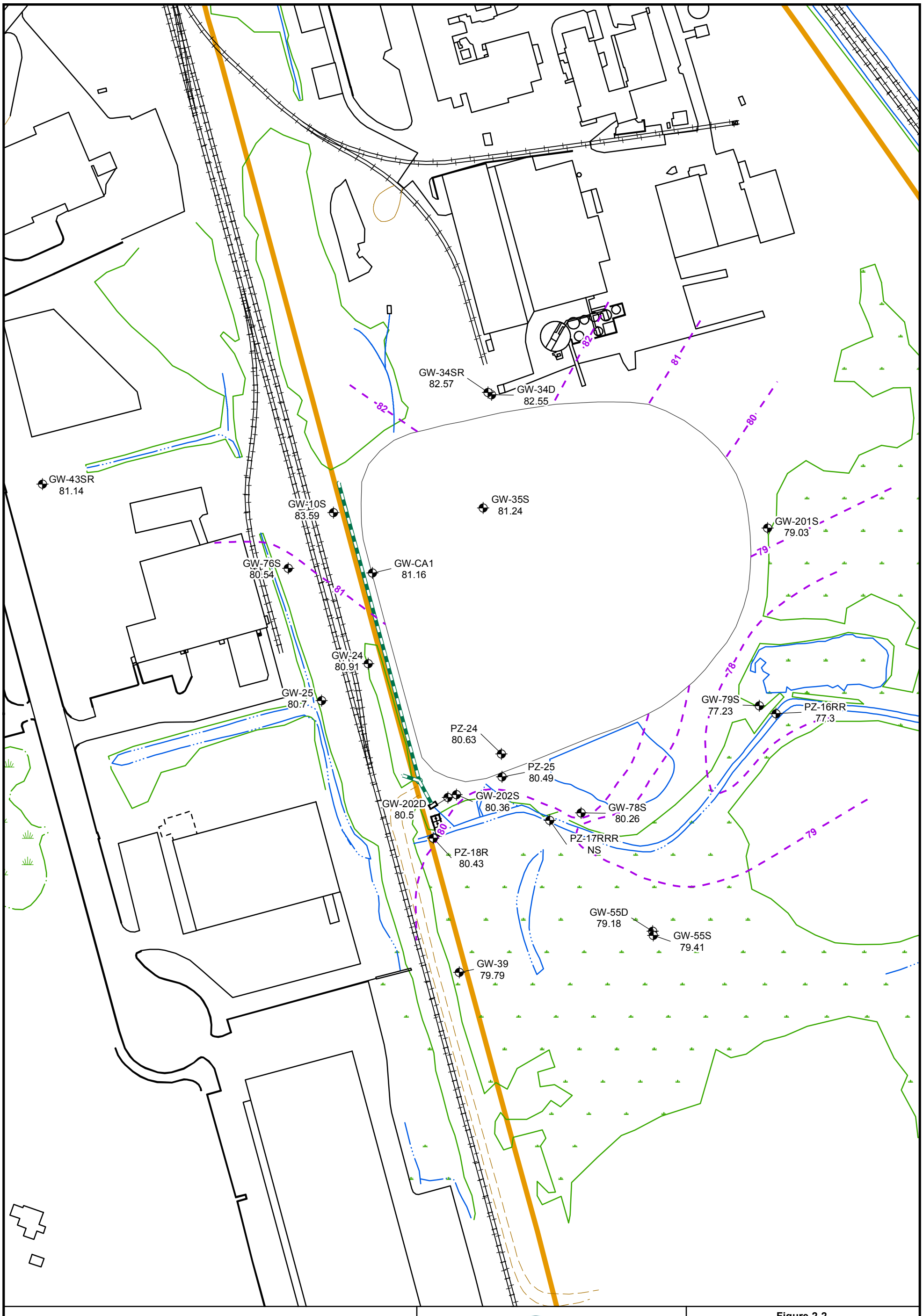

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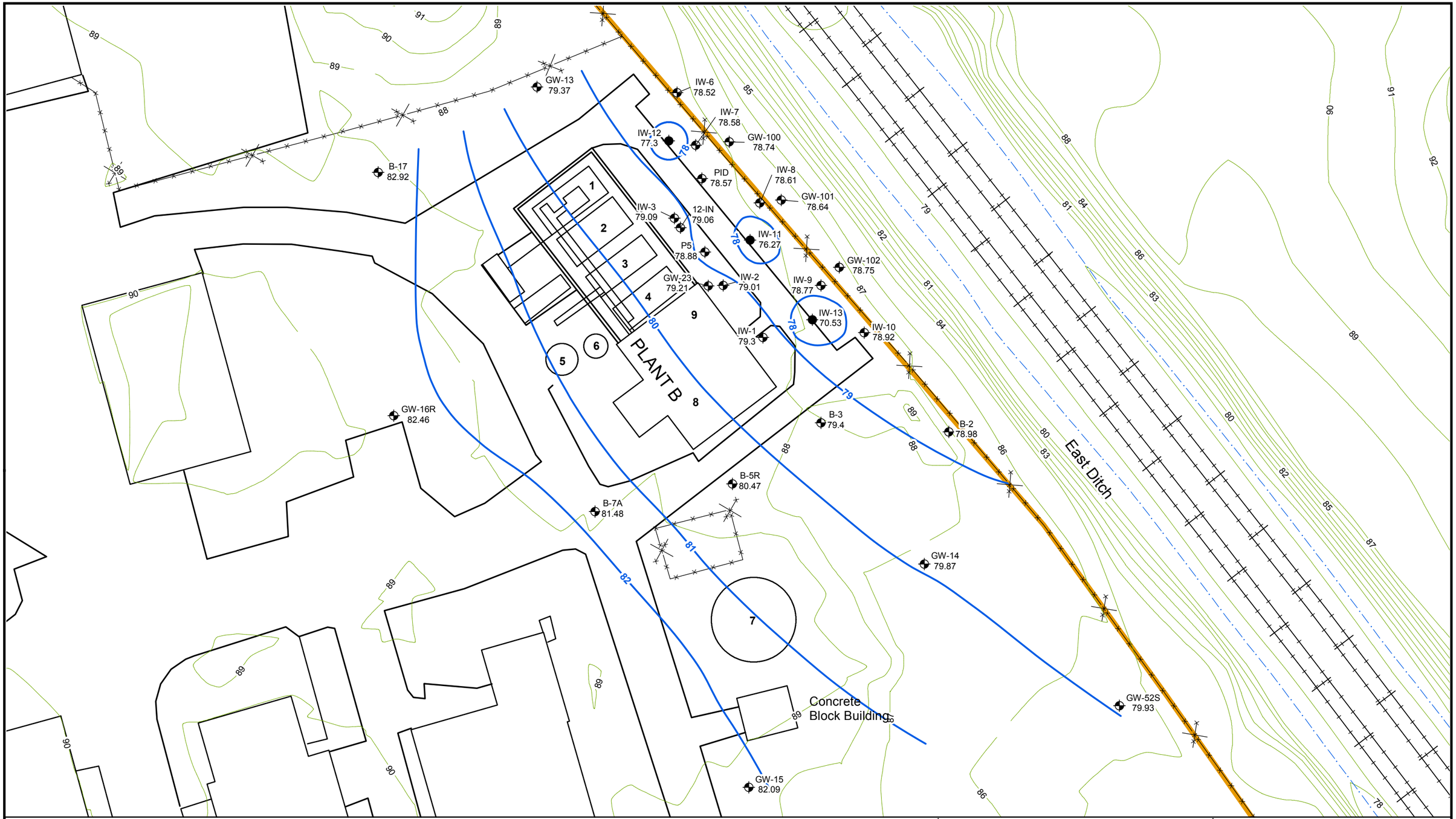

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Ditch
- Recovery Well
- Elevation Contours
- Monitoring Well

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N

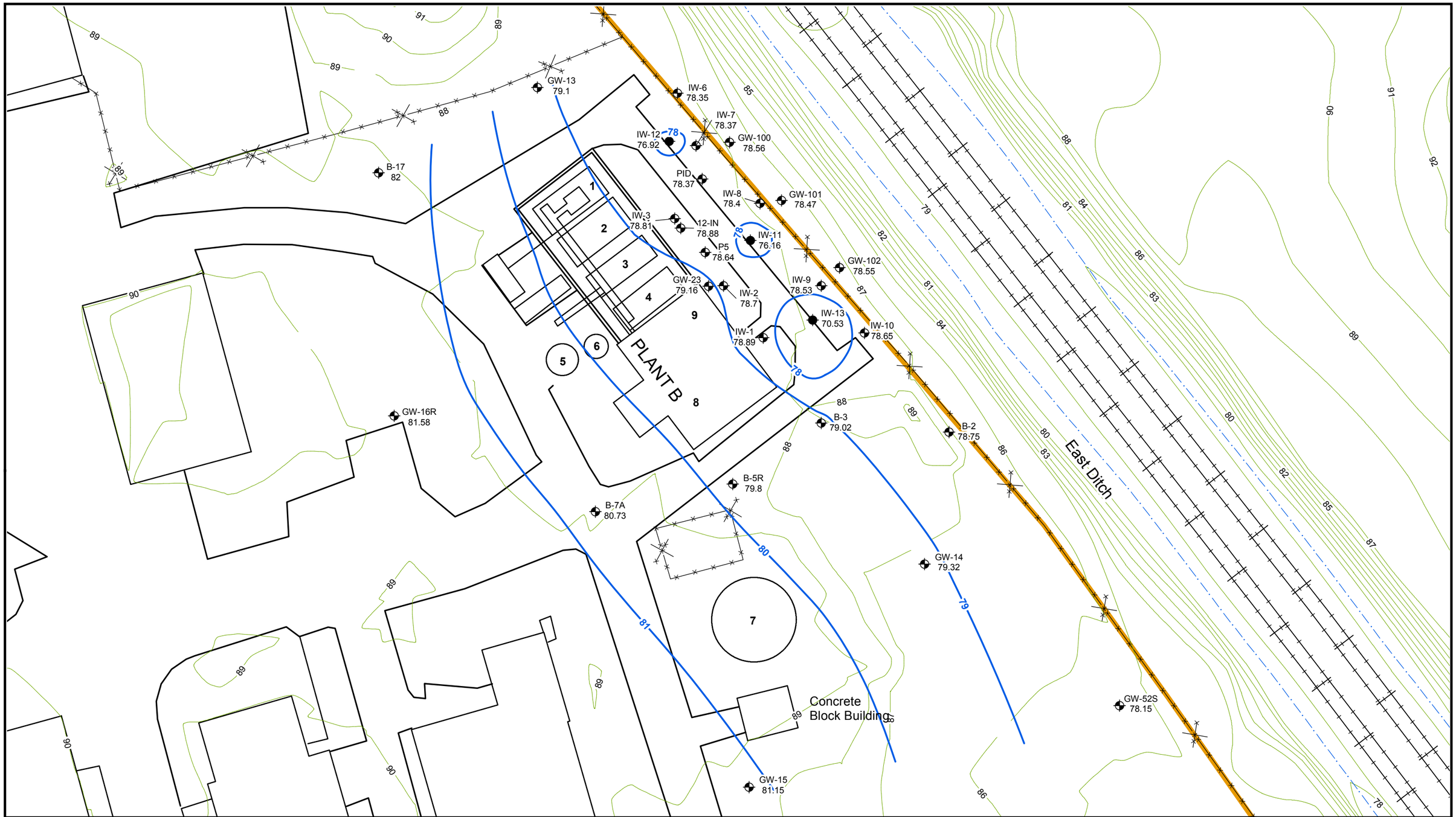
0 15 30 60 Feet

Figure 3-1
Plant B Interpreted Water Level Conditions - April 30, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/29/14 | Checked/Date: KRM 12/29/14

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_SASR_14_15.mxd P:\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Figures\Figure 3-1 - Plant B Interpreted Water Level Conditions April 30 2014.pdf



Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Ditch
- Recovery Well
- Elevation Contours
- Monitoring Well

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N

0 15 30 60 Feet

Figure 3-2
Plant B Interpreted Water Level Conditions - May 31, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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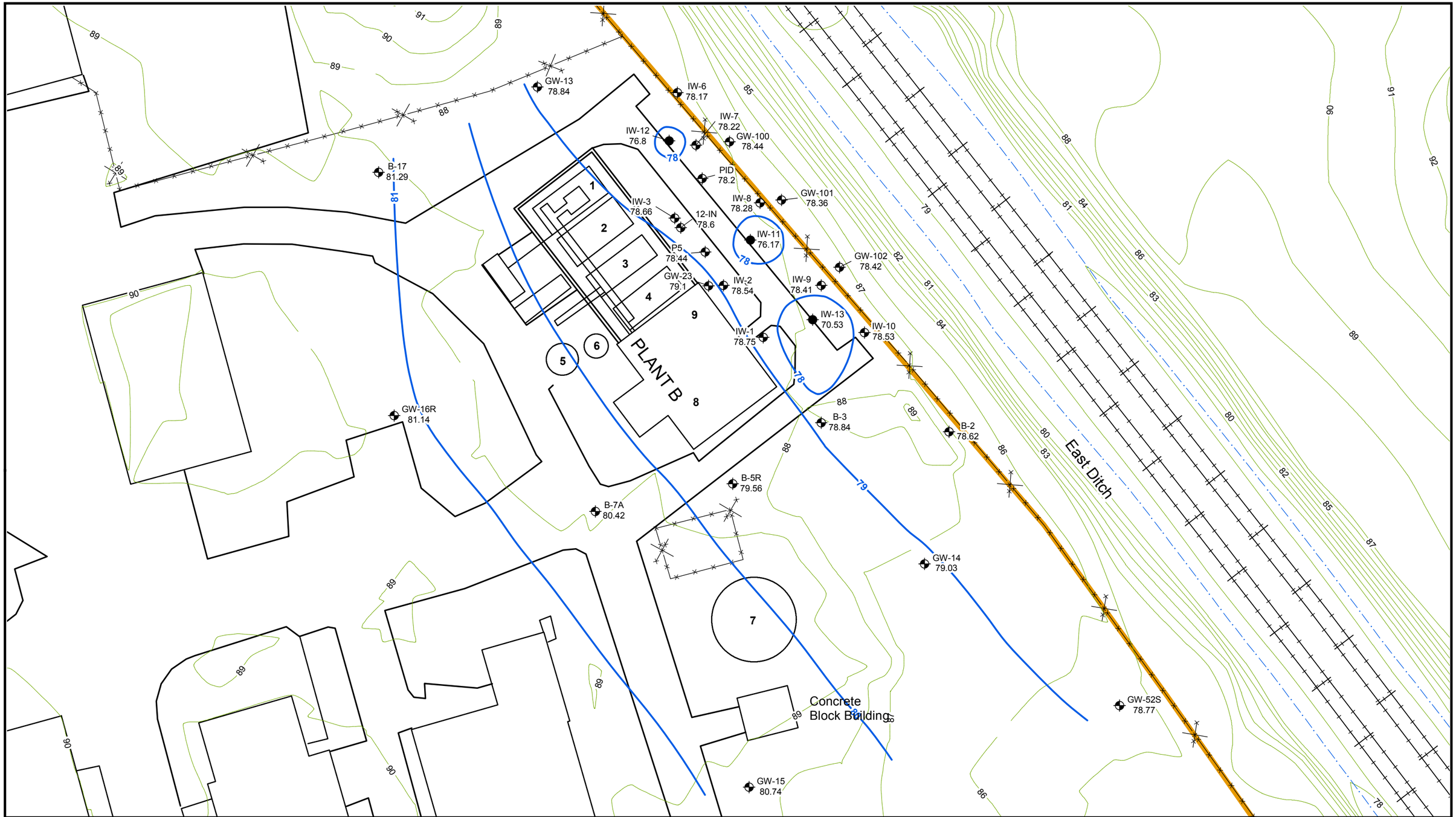

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Ditch
- Recovery Well
- Elevation Contours
- Monitoring Well

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Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3-3
Plant B Interpreted Water Level Conditions - June 30, 2014

Semi-Annual Status Report No. 15
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Wilmington, Massachusetts

Prepared/Date: BJR 12/29/14 | Checked/Date: KRM 12/29/14

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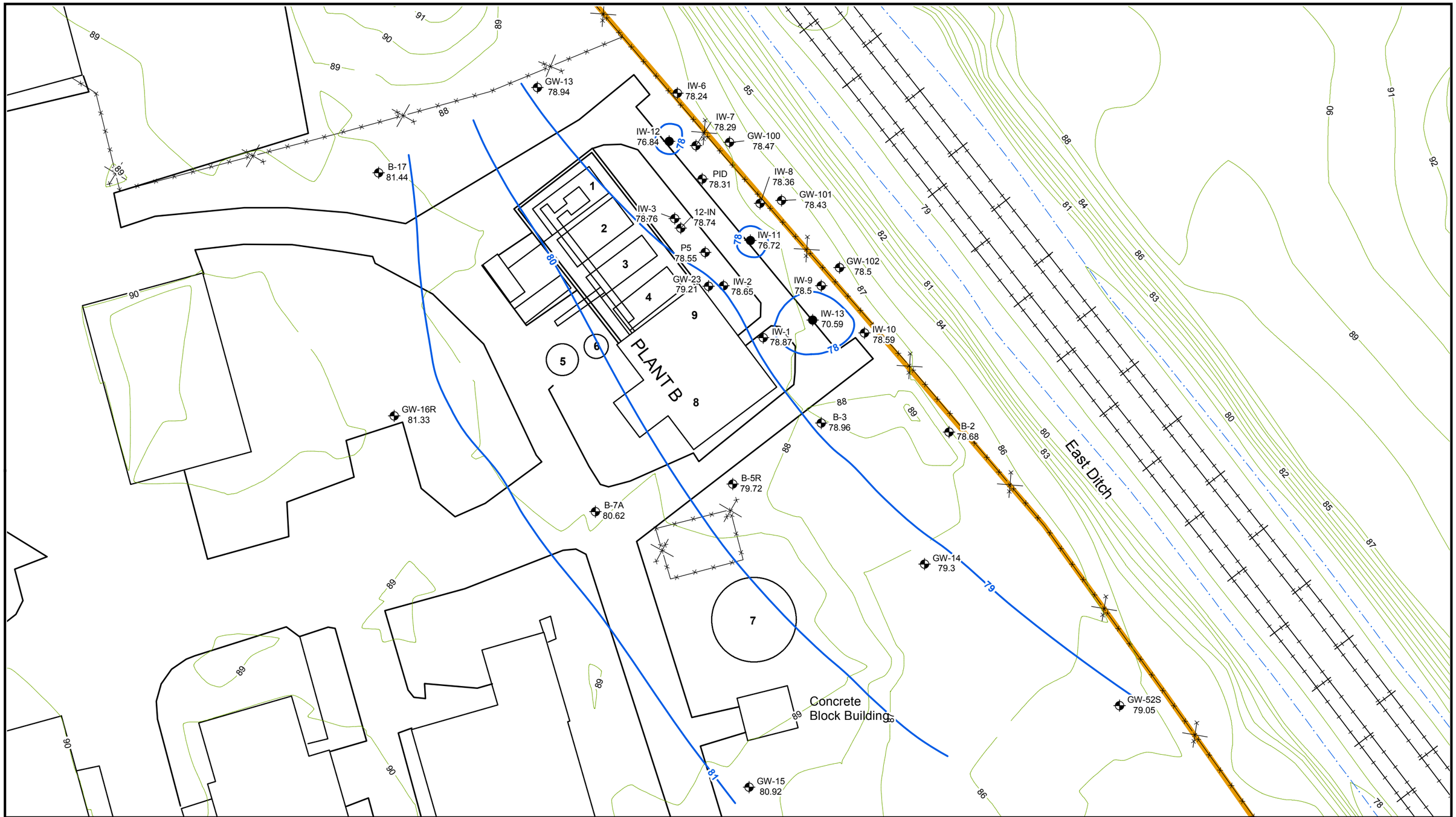

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Ditch
- Recovery Well
- Elevation Contours
- Monitoring Well

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Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3-4
Plant B Interpreted Water Level Conditions - July 31, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/29/14 | Checked/Date: KRM 12/29/14

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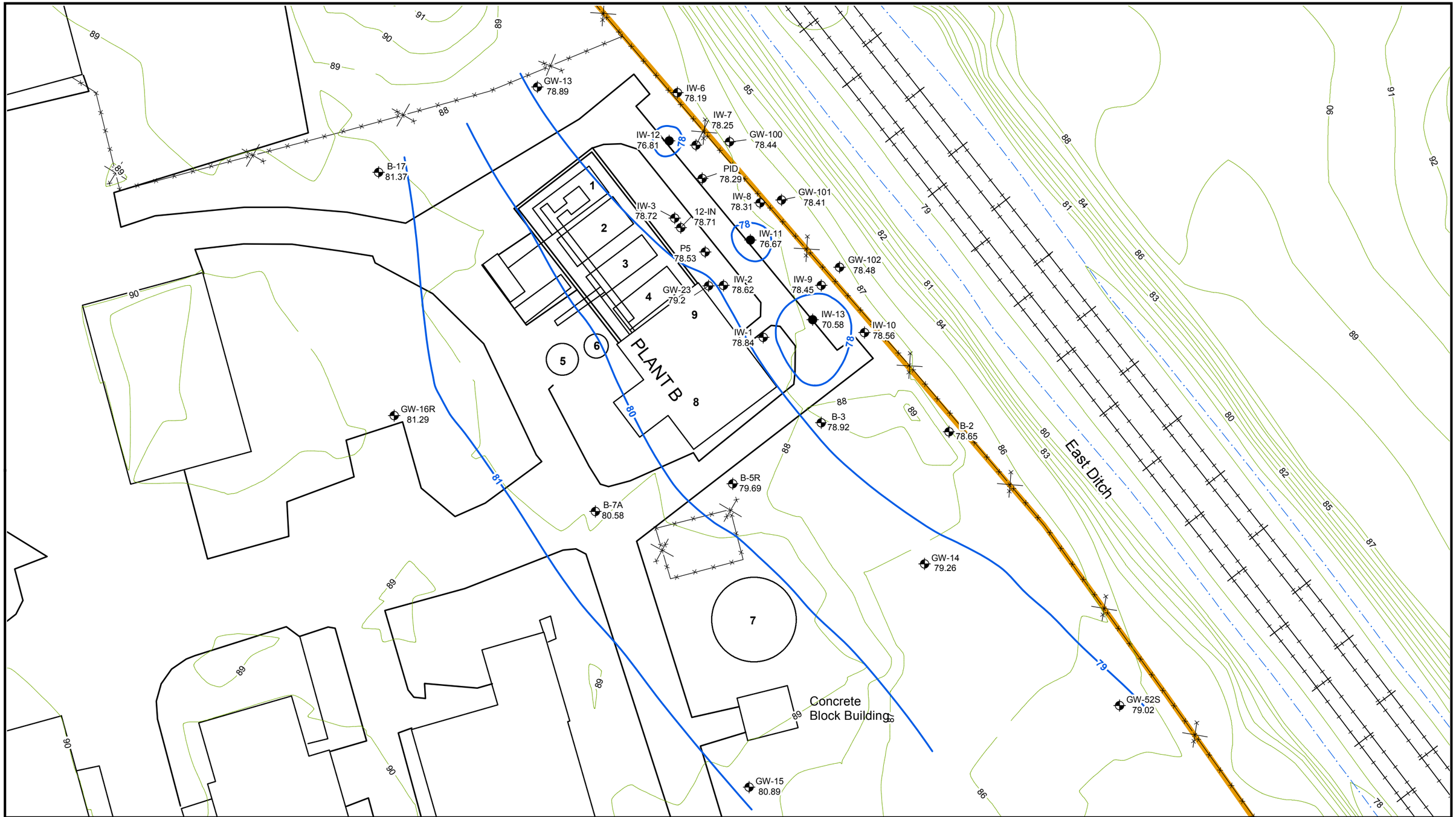

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Recovery Well
- Monitoring Well
- Ditch
- Elevation Contours

AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3-5
Plant B Interpreted Water Level Conditions - August 29, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/29/14 | Checked/Date: KRM 12/29/14

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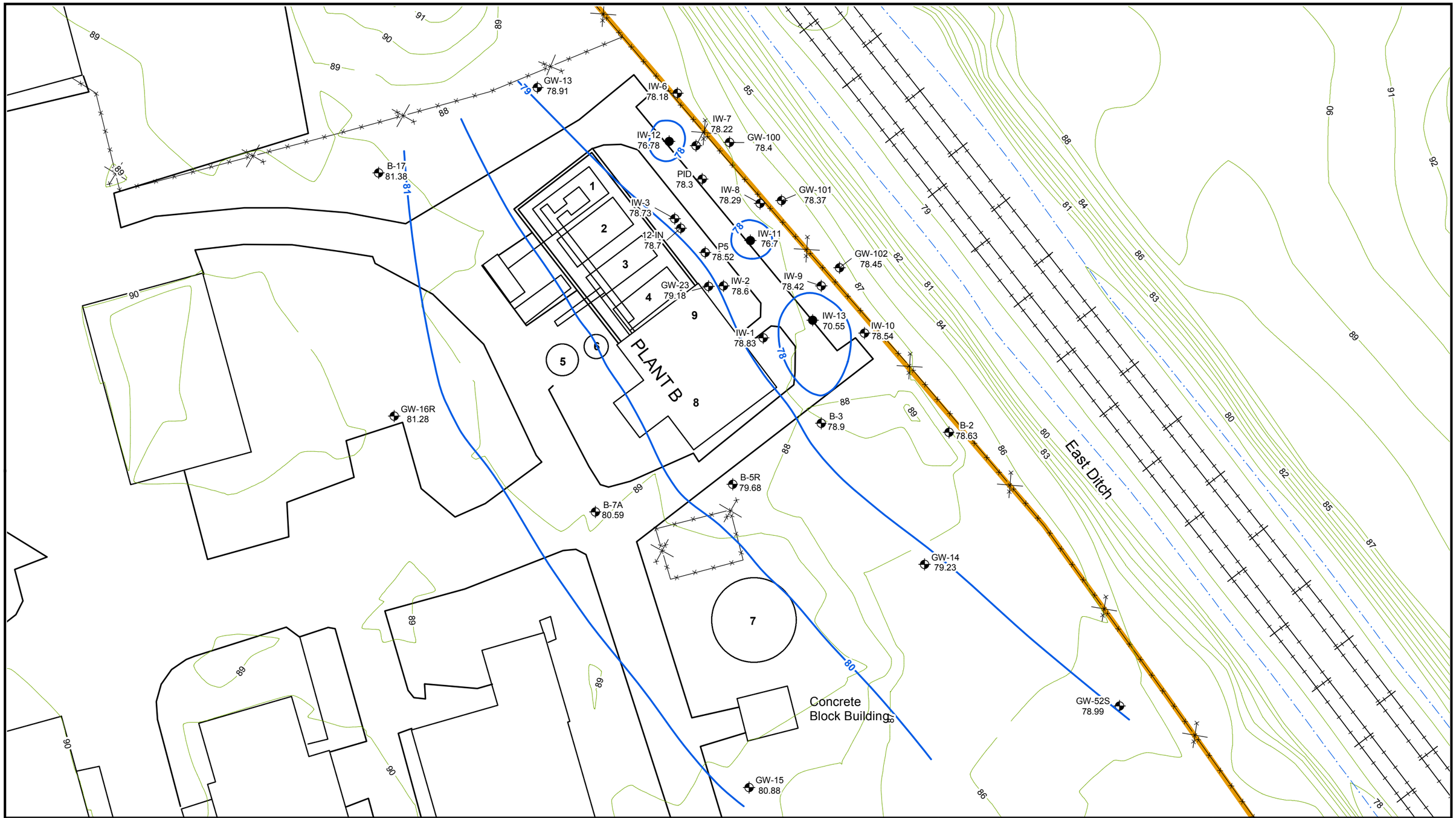

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Interpreted Potentiometric Contour Line (FT/MSL)
- Ditch
- Recovery Well
- Elevation Contours
- Monitoring Well

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N

0 15 30 60 Feet

Figure 3-6
Plant B Interpreted Water Level Conditions - October 1, 2014

Semi-Annual Status Report No. 15
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Wilmington, Massachusetts

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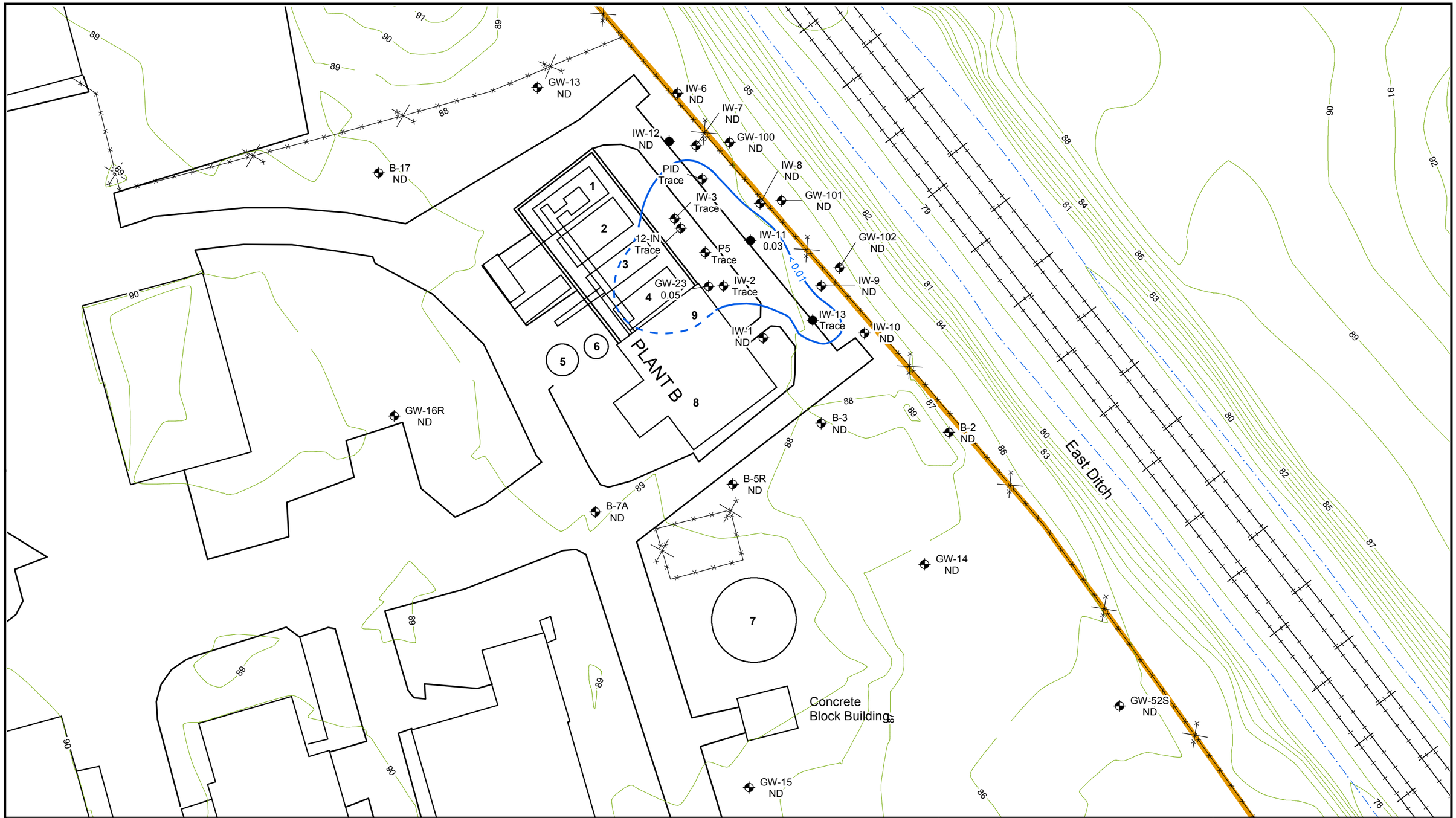

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-7
Plant B Interpreted LNAPL Thickness Contour - April 30, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: LCG 12/22/14

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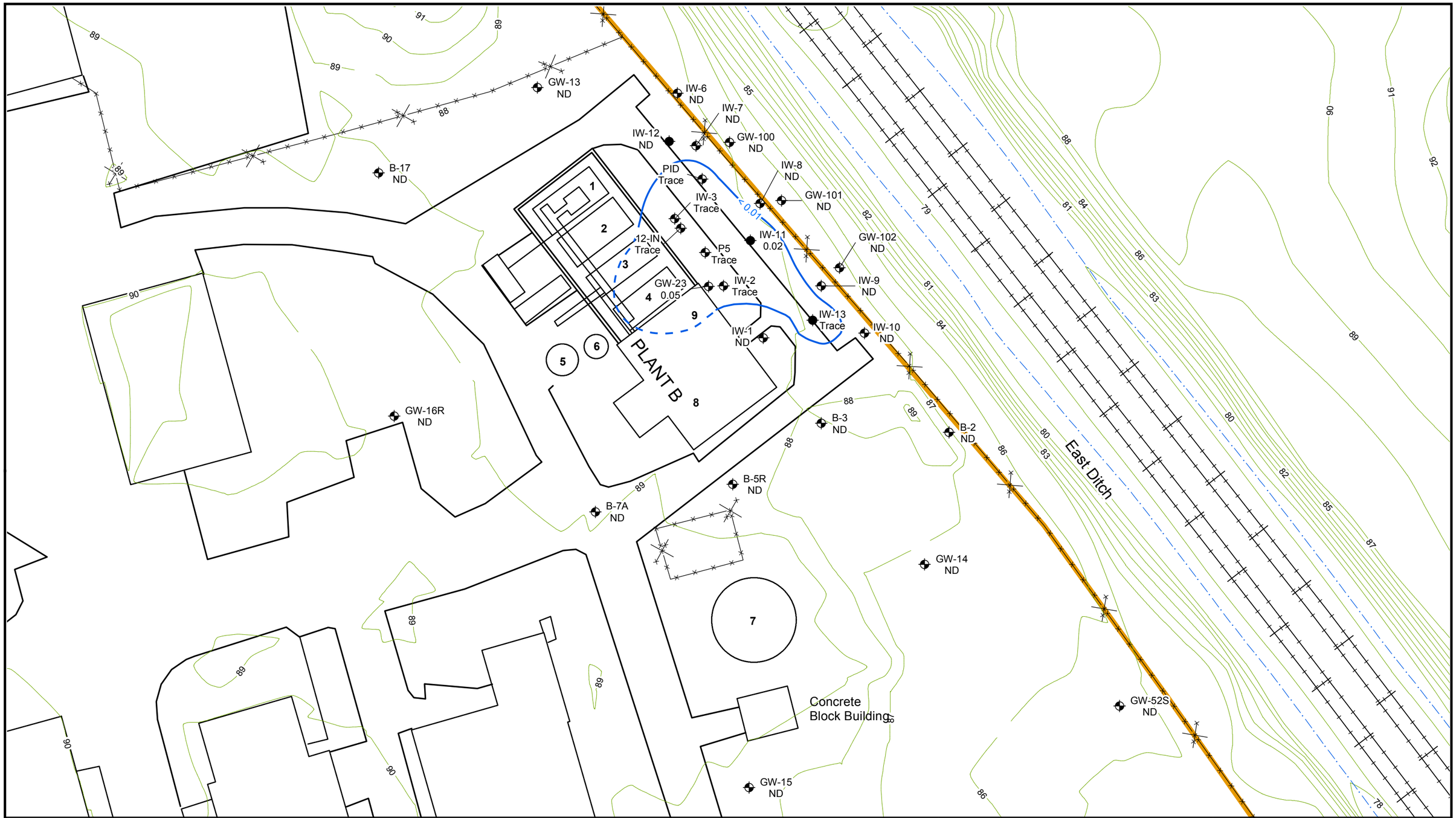

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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Chelmsford, MA 01824

N

0 15 30 60 Feet

Figure 3-8
Plant B Interpreted LNAPL Thickness Contour - May 31, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: LCG 12/22/14

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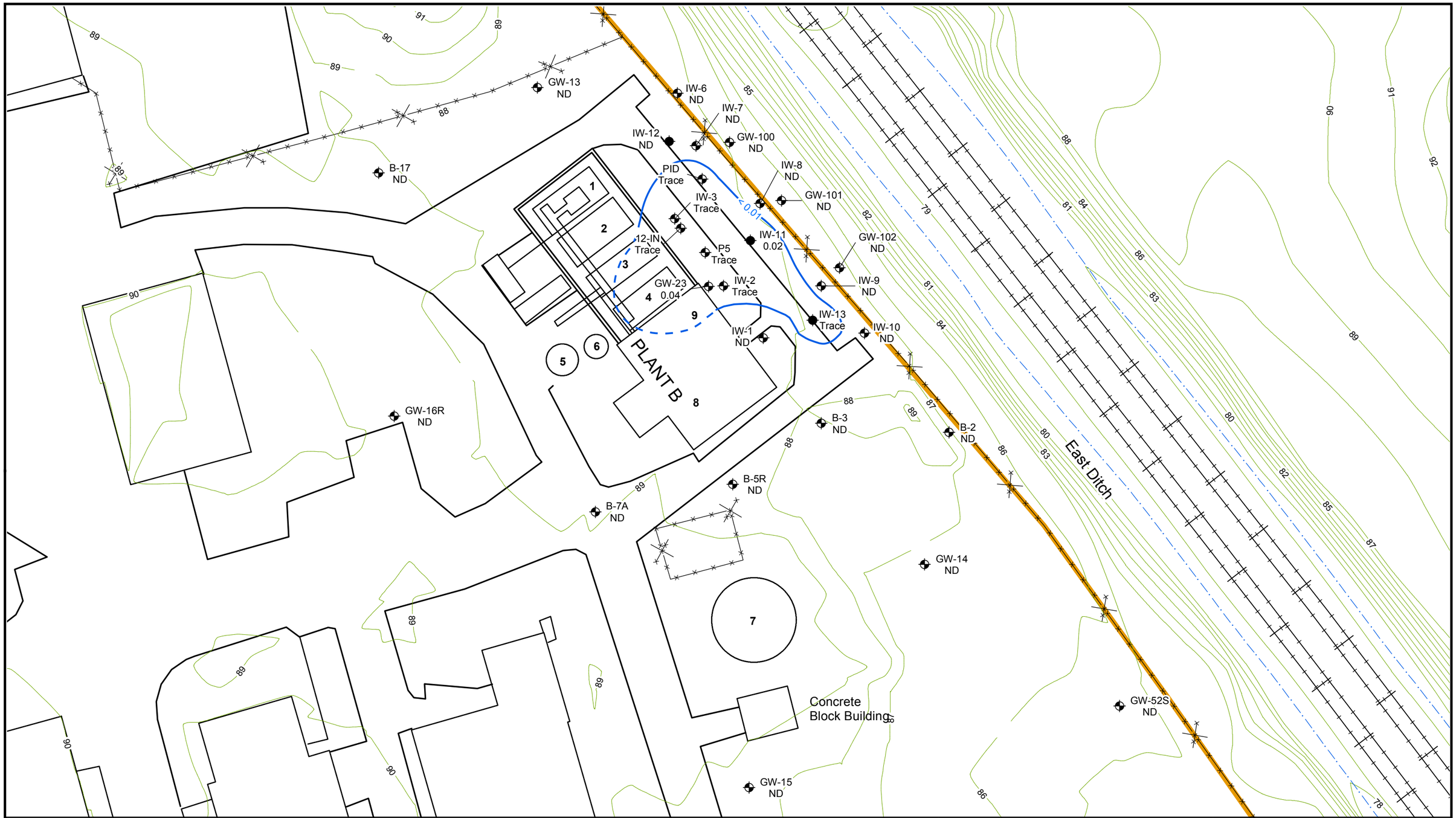

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
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Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-9
Plant B Interpreted LNAPL Thickness Contour - June 30, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: LCG 12/22/14

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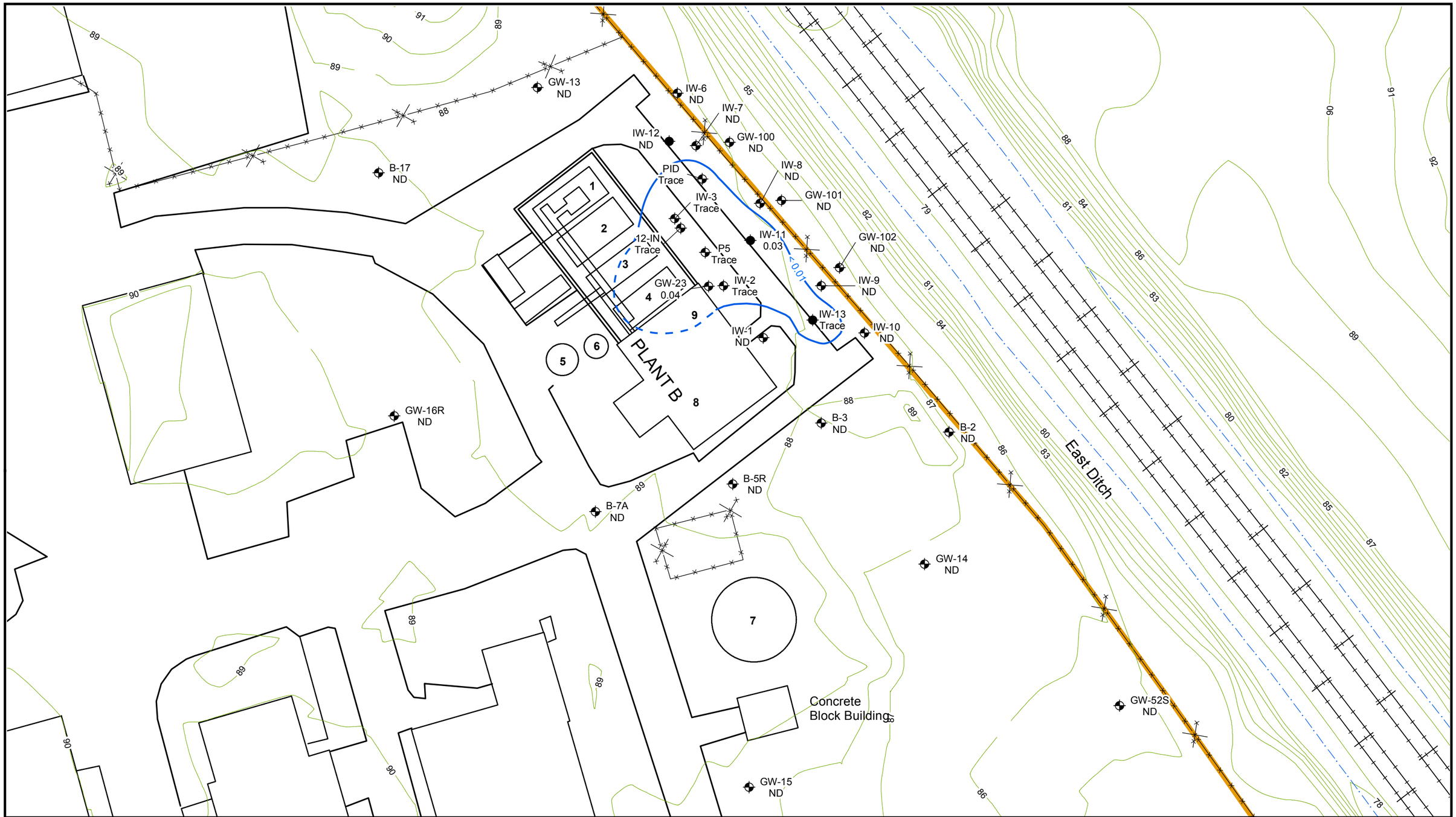

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-10
Plant B Interpreted LNAPL Thickness Contour - July 31, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: LCG 12/22/14

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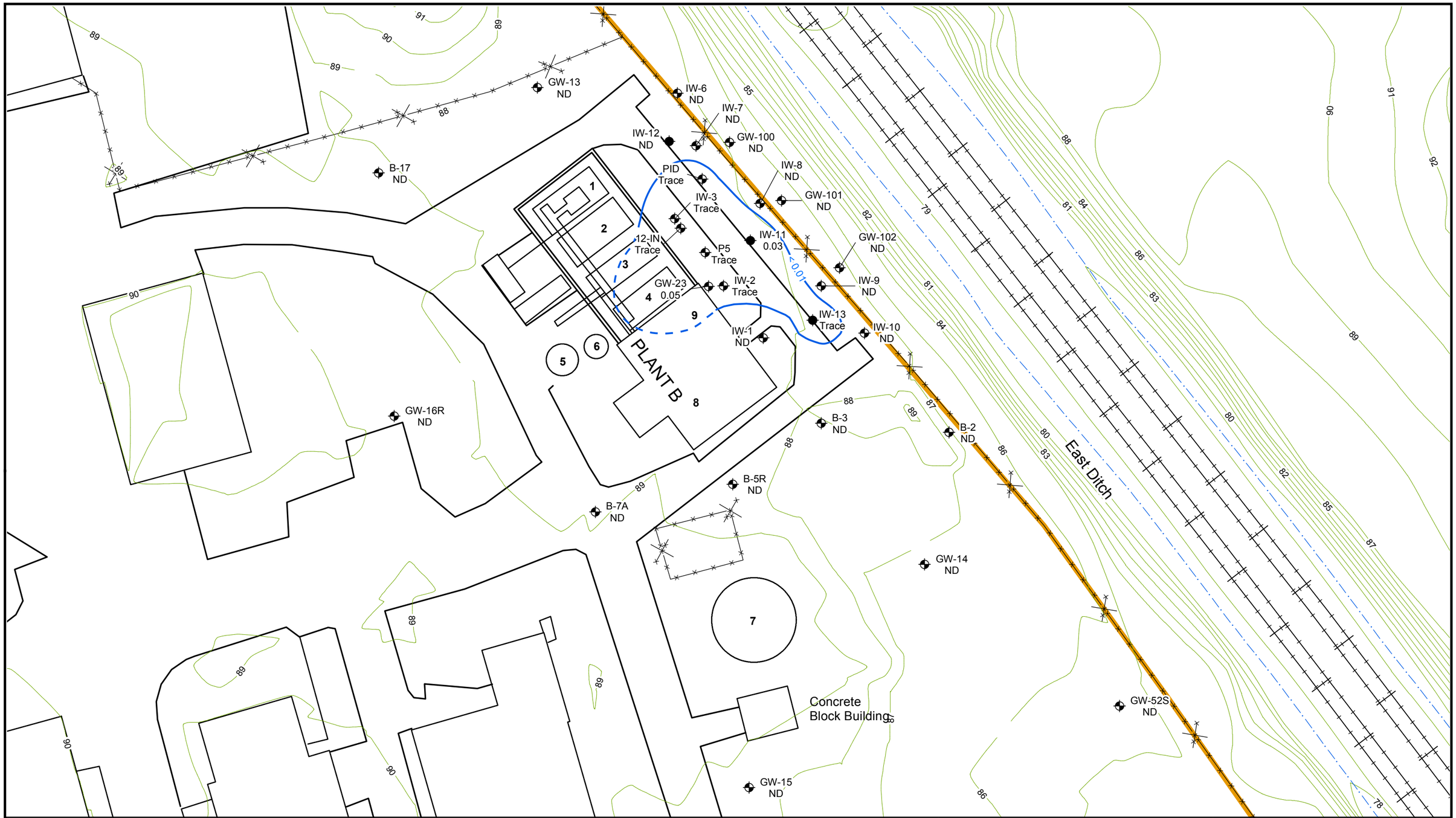

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-11
Plant B Interpreted LNAPL Thickness Contour - August 29, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 12/22/14 | Checked/Date: LCG 12/22/14

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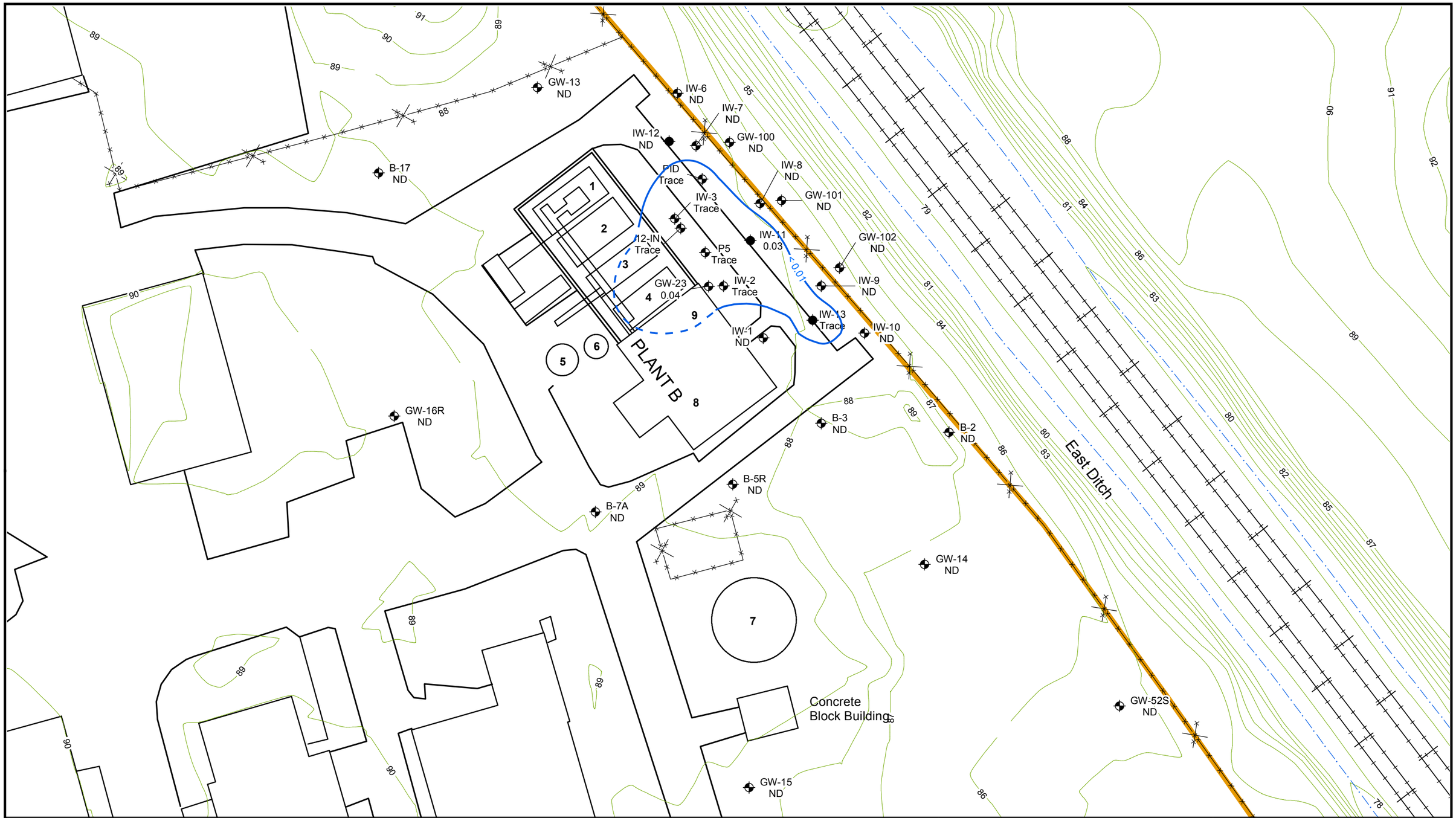

Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Recovery Well
- Monitoring Well
- Interpreted LNAPL Thickness Contour (ft)
- Inferred LNAPL Thickness Contour (ft)
- Ditch
- Elevation Contours

ND Not Detected
Trace Assumes Product Thickness of 0.01 ft

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N

0 15 30 60 Feet

Figure 3-12
Plant B Interpreted LNAPL Thickness Contour - October 1, 2014

Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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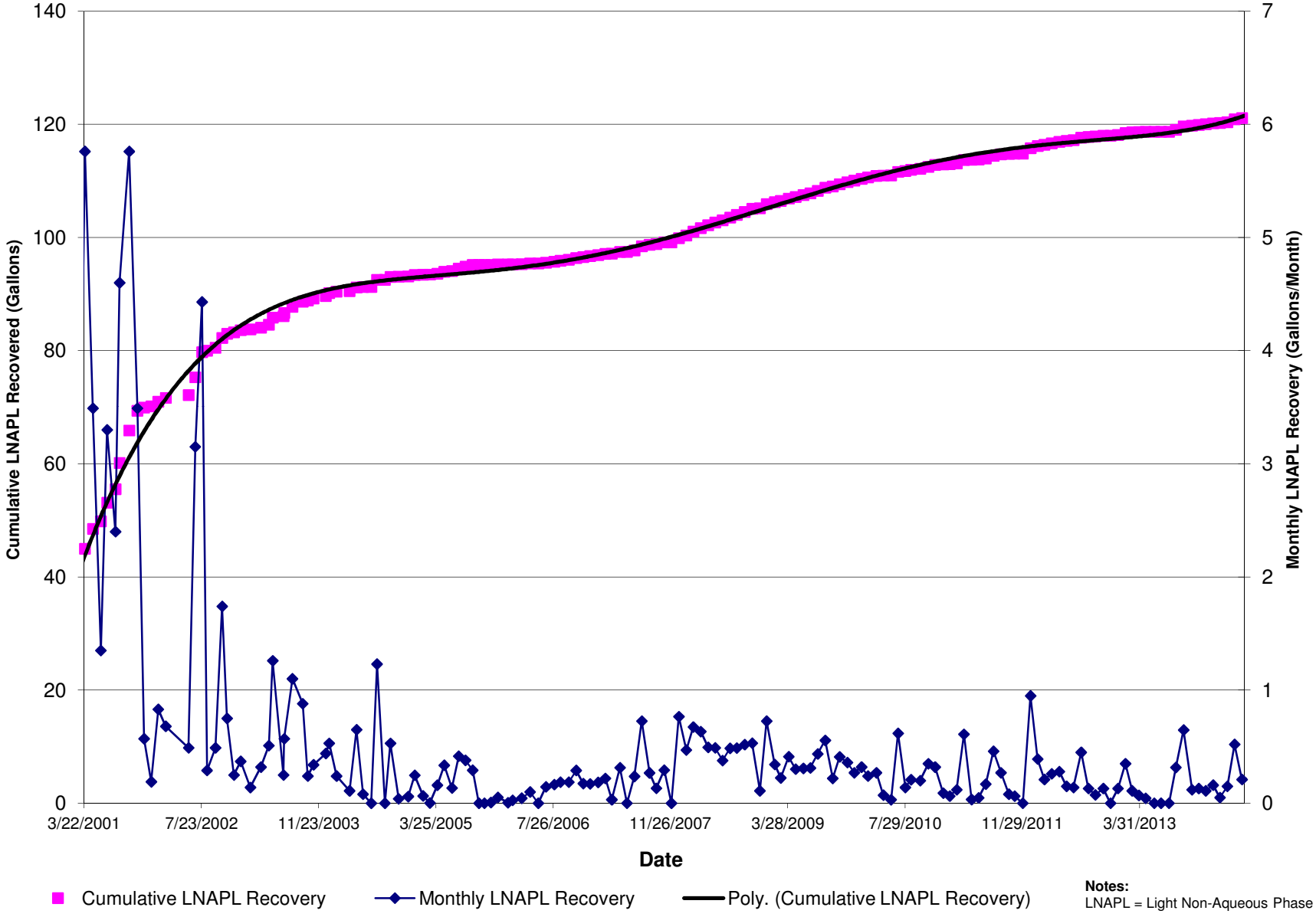
Figure 3-13
Monthly and Cumulative LNAPL Recovery
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts



Notes:
LNAPL = Light Non-Aqueous Phase Liquid

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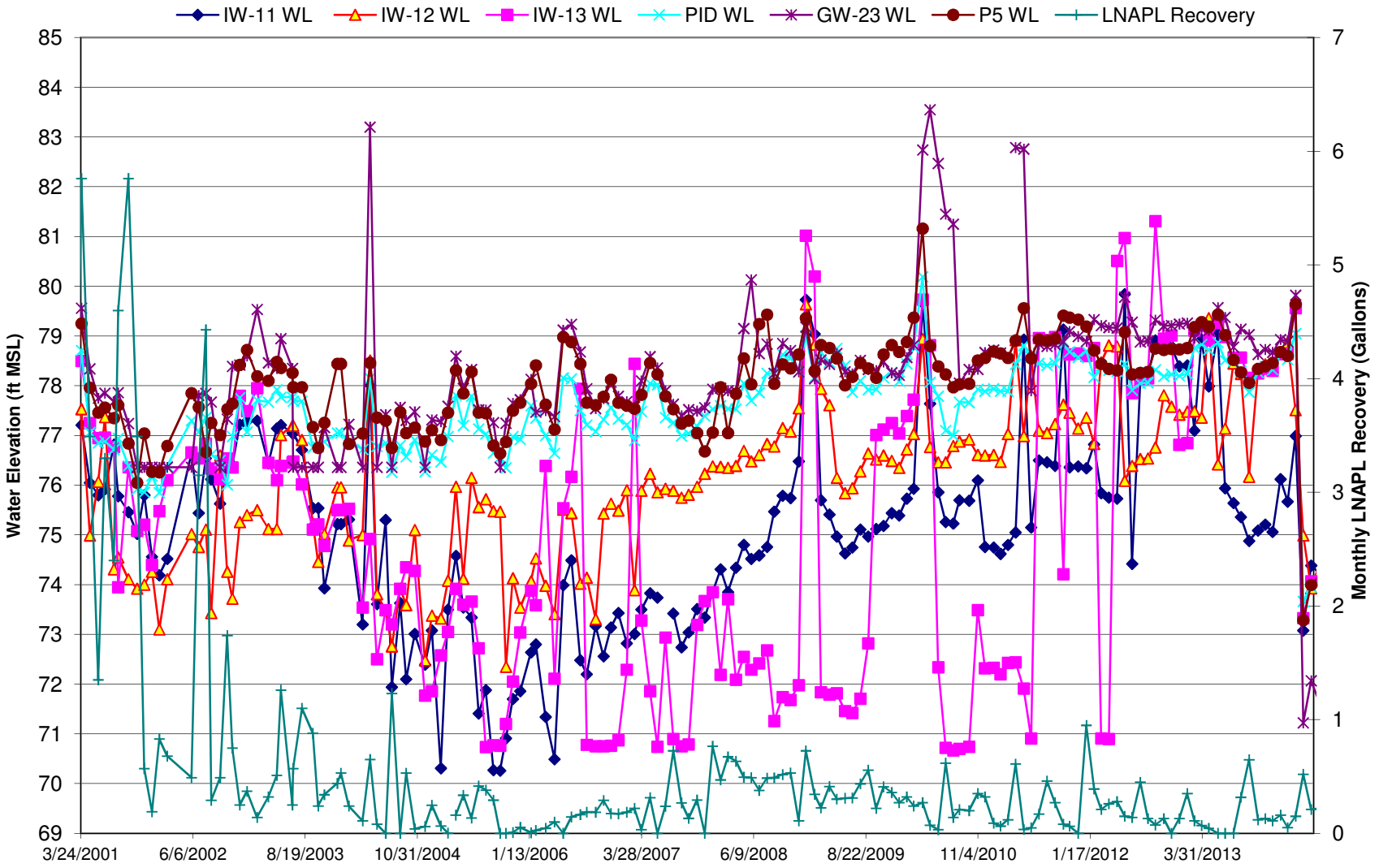
Monthy and Cumulative LNAPL Recovery Data Plot.xls, Figure 3-13

Prepared by / Date: LCG 12/16/2014
Checked by / Date: CTM 12/30/14

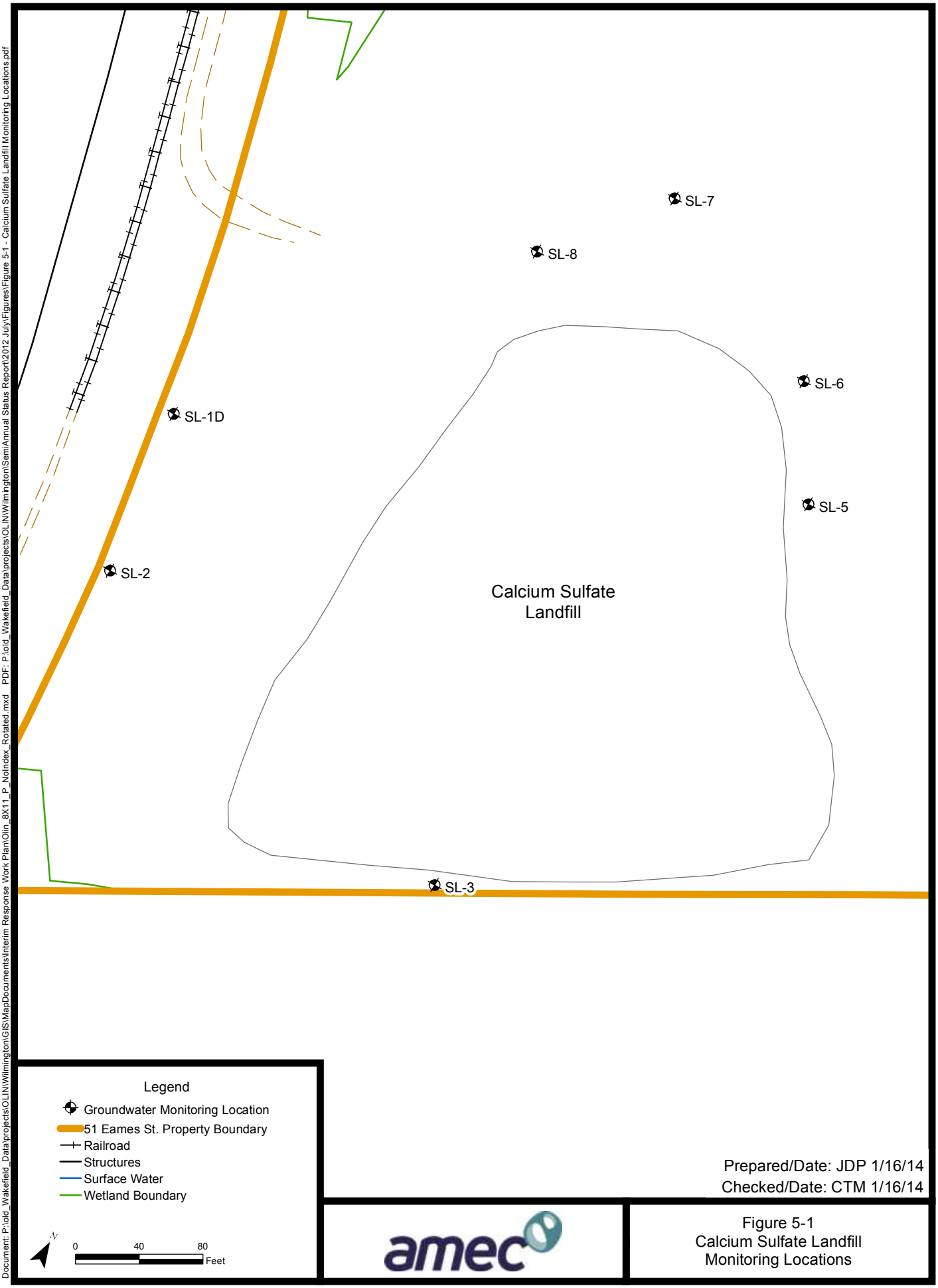
Figure 3-14
Water Levels (WL) and Monthly LNAPL Recovery
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts



Notes:
LNAPL = Light Non-Aqueous Phase Liquid

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Tables\
Monthy and Cumulative LNAPL Recovery Data Plot.xls, Figure3-14

Prepared by / Date: LCG12/16/2014
Checked by / Date: CTM 12/30/2014



Prepared/Date: JDP 1/16/14
Checked/Date: CTM 1/16/14

amec

Figure 5-1
Calcium Sulfate Landfill
Monitoring Locations

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APPENDIX A

Interim Response Steps Field Activity Reports

A-1 Second Quarter 2014 Sampling Event
A-2 Third Quarter 2014 Sampling Event

APPENDIX A

Interim Response Steps Field Activity Reports

A-1 Second Quarter 2014 Sampling Event

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
SECOND QUARTER 2014 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
SECOND QUARTER 2014 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

Prepared for:

Olin Corporation
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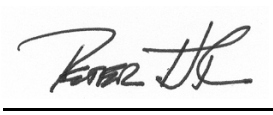
AMEC PROJECT NO. 6107140016.04

December 29, 2014



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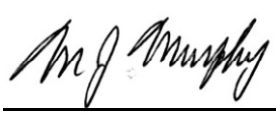

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GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
DO	Dissolved Oxygen
IRSWP	Interim Response Steps Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
NTU	Nephelometric Turbidity Units
ORP	Oxidation/Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
SC	Specific Conductivity
TAL	TestAmerica Laboratories, Inc.
USEPA	United States Environmental Protection Agency
UV	Ultraviolet

1.0 INTRODUCTION

On behalf of the Olin Corporation (Olin), AMEC Environment & Infrastructure, Inc. (AMEC) presents this summary report for field activities completed in association with the Second Quarter 2014 groundwater and surface water monitoring as well as the cap inspection for the Slurry Wall/Cap Monitoring Program and Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).

2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater and surface water in areas adjacent to and within the South Ditch and to monitor the physical condition of the temporary cap at the Containment Area of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The Second Quarter 2014 groundwater and surface water monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from 14 monitoring wells and five piezometers and collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch. Groundwater and surface water sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater and surface water sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of: collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-10S, GW-24, GW-25, GW-34SR, GW-34D, GW-35S, GW-43SR, GW-76S, GW-78S, GW-79S, GW-201S, GW-202S, GW-202D, and GW-CA-1; and piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RR, PZ-17RRR, and PZ-18R; inspecting and documenting the condition of the temporary cap; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, and surface water sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

On May 19, 2014, Olin personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water interface probe. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

On May 19-27, 2014, Olin personnel sampled groundwater from 14 monitoring wells and five piezometers using 2010 USEPA low stress (low flow) groundwater sampling methods.

Prior to low flow sampling, a Horiba U-52 water quality meter and a Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instruments calibration records are contained in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was continuously monitored using the multi-parameter water quality meter for pH, temperature, specific conductivity (SC), dissolved oxygen (DO), and oxidation/reduction potential (ORP), while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

No readings were noted outside the 2010 USEPA low flow stabilization guidelines. Locations GW-10S, GW-24, PZ-16RR, and PZ-17RRR went dry upon purging and could not be low flow sampled. Locations that draw down are typically purged dry and sampled upon recharging. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter, in-line Teflon™ filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On May 29, 2014, Olin personnel collected seven surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-3, ISCO-2, PZ-16RR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**.

Before field activities began, Horiba U-52 water quality meter and Hach 2100Q turbidity meter were properly calibrated to monitor surface water quality parameters at each location. The calibration records can be found in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

At each of the seven field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the Horiba probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water (approximately from 0.30 feet to 0.80 feet into the surface water). A peristaltic pump was used to reduce the entrapment of

floating or suspended sediment and provide positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

2.1.4 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. On May 22, 2014, AMEC downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the January 2015 Semi-Annual Status Report.

2.1.5 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness (**Figure 2**). These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) - resistant thread. The original temporary cap was installed in 2001 and consisted of a 6 mil thick sheet. Due to deterioration of the 6 mil sheet, it was replaced by the current 8 mil thick cover in 2003. The 8 mil cover was placed directly over the 6 mil cover and re-ballasted with sand bags to resist wind uplift. Quarterly inspections of the 8 mil cover were instituted in 2003 to evaluate the need for periodic maintenance and to document maintenance and repair activities.

On May 22, 2014, AMEC field personnel performed a visual inspection of the Temporary Cap surface. Photographs taken during the inspection are presented in **Appendix C**. In general, the temporary cap was observed to be in good condition and repairs previously completed by Olin personnel were intact. Major repairs (re-stitching the cap panels, replacing and adding sandbags; and adding ballast along the perimeter) on the western portion of the cap also appear to be in good condition. The temporary cap surface contains some sediment from previously deteriorated sand bags, small areas of vegetation, some minor fraying to the edges of some sheets that do not compromise the welded seams, and some minor tears around the bases of wells. AMEC's observations are summarized in **Figure 2**. Temporary cap monitoring activities are summarized below.

2.1.5.1 Activities Completed During This Inspection

- Walking and inspecting the sewn seams for evidence of deterioration of the UV–resistant thread.
- Observing areas of sewn seams that were in low spots.

- Checking sand bags and other areas where vegetation has rooted to verify the cap material has not been compromised.
- Providing photo-documentation of typical cap conditions.

2.1.5.2 Observations During This Inspection

- The scrim reinforced polyethylene cover remains flexible and is generally in good condition.
- Sewn seams utilizing UV-resistant thread are intact and do not appear to show signs of deterioration.
- AMEC observed some large tears and perforations on the cap surface, as well as minor tears around the bases of the monitoring wells within the cap area. These areas were identified to the Olin on-Site manager for repair by Olin as part of normal maintenance.
- Wild seeding from surrounding areas has resulted in vegetation outgrowths from under sand bags and vegetation growing above the cap surface. These plant roots, where observed, do not appear to penetrate the underlying polyethylene sheet; however, AMEC recommends removal of this vegetation.
- Small areas of standing water were observed on the cap surface, including surrounding the main drain.
- The gravel ballast placed along the perimeter of the cap remains in place.
- Although some patches of vegetation surround the cap internal drain grate, they do not appear to impede the active draining of standing water from the cap surface.

2.1.5.3 Discussion

Outside the areas of recent replacement, the general physical condition of the remaining cap membrane is good considering its age and service conditions (direct exposure to sunlight and the elements).

The areas of vegetation growth that exist above the cap surface do not appear to affect the polyethylene sheeting. The polyethylene sheet continues to perform its intended function as the UV protection provided by its carbon black content has protected the polymer from significant deterioration.

Olin site personnel have repaired previous perforations and minor damage to the cap with a polyethylene repair tape with mastic backing. These repairs were generally observed to be in good condition and do not require resealing. Olin will continue to repair perforations observed by AMEC during their quarterly cap inspections.

2.1.5.4 Recommendations

It is recommended that the current program of cap inspections and maintenance (including: patching the perforations noted during the cap inspection; inspecting the internal drain and removing vegetation within the drain grate; removing vegetation growing on the cap; and visually monitoring the cap for future changes in condition) be continued.

3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The Second Quarter 2014 Plant B Monitoring Program consisted of measuring groundwater levels from 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low flow (low stress) groundwater sampling at monitoring well GW-16R. Groundwater monitoring wells from the Plant B Monitoring Program are listed in **Table 7** and the monitoring well locations are shown on **Figure 3**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On May 29, 2014, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 7**.

3.1.2 Groundwater Sampling

On May 29, 2014, Olin personnel sampled groundwater from monitoring well GW-16R following the 2010 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a Horiba U-52 water quality meter and Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instrument calibration record is contained in **Appendix A**. A calibration check was also performed at the end of each day and is recorded on the calibration records. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the Horiba U-52 multi-parameter water quality meter for pH, temperature, SC, DO, and ORP, while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. No readings were noted outside the 2010 USEPA low flow stabilization guidelines. The final low flow purging field parameter measurements are presented in **Table 8**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in

Table 9. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 REFERENCES

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. *Final Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

TABLES

Table 1
Groundwater and Surface Water Sampling Locations
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Groundwater	Surface Water
GW-10S	ISCO1
GW-24	ISCO2
GW-25	ISCO3
GW-26 *	PZ-16RR
GW-34SR	PZ-17RRR
GW-34D	**PZ-18R**
GW-35S	SD-17
GW-42S **	
GW-43SR	
GW-76S	
GW-78S	
GW-79S	
GW-201S	
GW-202S	
GW-202D	
GW-CA1	
PZ-16RR	
PZ-17RRR #	
PZ-18R	
PZ-24	
PZ-25	
GW-16R ^	

Notes:
Bold - DUP/ MS/ MSD collected
* - Well removed for detention basin construction
** - Well destroyed
# - Piezometer replaced in South Ditch
^ - Plant B Monitoring Well

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

Table 2
Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation	Depth to Water (1, 2)	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		5/19/2014
GW-10S	89.10	8.32	80.78	TOC	
GW-24	83.43	2.31	81.12		
GW-25	85.97	5.04	80.93		
GW-26*	84.93	*	---		
GW-34D	90.36	7.64	82.72		
GW-34SR	89.13	6.35	82.78		
GW-35S	88.51	7.07	81.44		
GW-39	83.64	3.65	79.99		
GW-42S**	84.18	**	---		
GW-43SR	87.86	6.52	NS		
GW-55D	81.95	2.17	79.78		
GW-55S	81.70	2.52	79.18		
GW-76S	88.45	7.73	80.72	TOC	
GW-78S	84.89	4.41	80.48		
GW-79S	81.54	3.55	77.99		
GW-201S	83.29	4.07	79.22		
GW-202D	86.52	6.28	80.24		
GW-202S	86.97	5.70	81.27		
GW-CA1	88.01	6.68	81.33		
PZ-16RR/IN	81.0	3.11	77.89		
PZ-16RR/OUT (4)	81.0	Dry	---		
PZ-17RRR/IN	***	2.09	---		
PZ-17RRR/OUT (4)	***	2.09	---		
PZ-18R/IN	82.42	1.82	80.60		
PZ-18R/OUT (4)	82.42	1.84	80.58		
PZ-24	89.43	8.51	80.92		
PZ-25	88.90	8.11	80.79		

Notes:

(1) - Measurement from top of PVC. If no PVC, measurement from TOC
(2) - Collected using a Solinst water interface probe
(3) - Groundwater Elevation = Reference Elevation - Depth to Water
(4) - Reported elevation of surface water adjacent to piezometer
TOC - Water level measurement taken from Top of Casing
* - Well removed for detention basin construction
** - Well destroyed during paving
*** - Piezometer replaced in South Ditch. Not surveyed
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

Table 3
Final Field Parameters for Groundwater Sampling
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Monitoring Well Samples						**Quarterly Slurry Wall/Cap Piezometer Samples**				
Location	GW-25	GW-78S	GW-79S	GW-202S	GW-202D	PZ-16RR	PZ-17RRR	PZ-18R	PZ-24	PZ-25
Date	5/19/2014	5/22/2014	5/22/2014	5/20/2014	5/20/2014	5/22/2014	5/22/2014	5/21/2014	5/22/2014	5/20/2014
Depth to Water (ft)	5.27	4.61	3.55	6.30	7.81	Dry	Dry	2.59	8.59	8.14
Temperature (° C)	14.26	9.85	12.16	12.96	13.09	16.62	14.74	12.99	14.01	14.81
Specific Conductivity (mS/cm)	0.839	1.33	2.33	0.776	4.19	1.42	1.03	6.27	1.80	1.11
pH (standard units)	6.68	6.65	6.20	6.29	4.71	7.17	7.38	6.60	6.45	6.44
Dissolved Oxygen (mg/L)	< 0.01	< 0.01	< 0.01	< 0.01	0.01	8.51	1.15	< 0.01	< 0.01	< 0.01
Turbidity (NTU)	1.42	1.39	8.72	1.19	3.90	16.7	68.2	5.21	21.9	1.14
ORP (millivolts)	-131.0	25.0	-2.0	109.0	234.0	-107.0	-162.0	-102.0	-50.0	35.0

Semiannual Slurry Wall/Cap Monitoring Well Samples									
Location	GW-10S	GW-24	GW-34SR	GW-34D	GW-35S	GW-43SR	GW-76S	GW-201S	GW-CA-1
Date	5/19/2014	5/19/2014	5/21/2014	5/21/2014	5/21/2014	5/27/2014	5/19/2014	5/27/2014	5/21/2014
Depth to Water (ft)	Dry	Dry	6.35	7.66	7.35	6.52	7.73	4.23	6.68
Temperature (° C)	14.00	10.51	13.72	14.83	16.35	14.45	11.10	12.58	14.43
Specific Conductivity (mS/cm)	0.129	0.411	0.061	0.163	1.32	0.970	0.344	2.99	0.401
pH (standard units)	5.92	7.98	5.70	6.57	6.91	5.13	5.99	6.45	7.09
Dissolved Oxygen (mg/L)	10.91	6.01	0.92	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.11
Turbidity (NTU)	6.92	31.2	1.44	1.84	8.09	1.97	21.1	2.02	1.49
ORP (millivolts)	62.0	-111.0	152.0	68.0	-86.0	257.0	65.0	102.0	13.0

Notes:
ft - feet
mS/cm - (milliSiemens per centimeter)
mg/L - milligrams per liter
NTU - nephelometric turbidity units
mV - millivolts
ORP - Oxidation/Reduction Potential

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

Table 4
Groundwater Laboratory Analytical Program
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.35	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	µg/L
Chromium, filtered	SW846 6010B	1.0	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

Table 5
Final Field Parameters for Surface Water Sampling
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Surface Water Samples							
Location	ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RRR	PZ-18R	SD-17
Date	5/29/2014	5/29/2014	5/29/2014	5/29/2014	5/29/2014	5/29/2014	5/29/2014
Depth of Water (ft)	0.80	0.35	0.35	0.30	0.33	0.50	0.30
Temperature (° C)	12.90	13.72	20.74	12.92	12.85	13.43	12.88
Specific Conductivity (mS/cm)	0.624	0.717	0.760	0.754	0.815	0.811	0.816
pH (standard units)	6.35	6.68	6.64	6.70	6.63	6.39	6.56
Dissolved Oxygen (mg/L)	4.01	7.22	7.70	6.60	6.60	3.73	5.56
Turbidity (NTU)	4.57	23.3	6.58	14.4	8.53	4.02	8.65
ORP (millivolts)	86.0	17.0	38.0	16.0	14.0	48.0	22.0

Notes:
ft - feet
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
NTU - nephelometric turbidity units
mV - millivolts
ORP - Oxidation/Reduction Potential

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

Table 6
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.28	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.34	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	µg/L
Chromium, Total	SW846 6010B	1.0	µg/L
Sodium, Total	SW846 6010B	320	µg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	µg/L
Chromium, Filtered	SW846 6010B	1.0	µg/L
Sodium, Filtered	SW846 6010B	320	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: CTM 10/06/201
Checked by: KRM 10/06/201

Table 7
Groundwater Elevations
Plant B Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation (1)	Depth to Water (2)	Depth to Product (3)	Product Thickness (4)	Groundwater Elevation (5)	Date Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	5/29/2014
B-2	90.48	11.73	NPD	NA	78.75	
B-3	90.32	11.30	NPD	NA	79.02	
B-5R	91.38	11.58	NPD	NA	79.80	
B-7A	88.81	8.08	NPD	NA	80.73	
B-17	91.55	9.55	NPD	NA	82.00	
GW-13	90.57	11.47	NPD	NA	79.10	
GW-14	88.70	9.38	NPD	NA	79.32	
GW-15	90.01	8.86	NPD	NA	81.15	
GW-16R	91.21	10.83	NPD	NA	80.38	
GW-23	91.04	11.93	11.88	0.05	79.16	
GW-52S	87.95	9.80	NPD	NA	78.15	
GW-100	90.15	11.59	NPD	NA	78.56	
GW-101	90.14	11.67	NPD	NA	78.47	
GW-102	89.00	10.45	NPD	NA	78.55	
IW-1	90.71	11.82	NPD	NA	78.89	
IW-2	90.53	11.84	NPD	trace	78.69	
IW-3	90.76	11.96	NPD	trace	78.80	
IW-6	89.15	10.80	NPD	NA	78.35	
IW-7	90.10	11.73	NPD	NA	78.37	
IW-8	89.94	11.54	NPD	NA	78.40	
IW-9	89.78	11.25	NPD	NA	78.53	
IW-10	90.43	11.78	NPD	NA	78.65	
IW-11	89.92	13.78	13.76	0.02	76.16	
IW-12	90.31	13.39	NPD	trace	76.92	
IW-13	89.90	19.38	NPD	trace	70.52	
PID	89.97	11.61	NPD	trace	78.36	
P5	90.45	11.82	NPD	trace	78.63	
12-IN	89.84	10.97	NPD	NA	78.87	

Notes:

Prepared by: CTM 10/06/2014

Checked by: KRM 10/06/2014

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98

(2) - Top of PVC. If no PVC, measurement from top of steel casing

(3) - Collected using a Solinst water interface probe or Geotech oil/water interface probe

(4) - If sheen is noted, a product thickness of 0.01 feet will be used to calculate the groundwater elevation

(5) - Groundwater Elevation = Reference Elevation - (Depth to Water - (Product Thickness x 0.95))

TOC - Top of Casing

NPD - No Product Detected

NA - Not Applicable

East Ditch - No sheen noted; Observed OK

Table 8
Final Field Parameters for Groundwater Sampling
Plant B Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Plant B Monitoring Well Samples	
Location	GW-16R
Date	5/29/2014
Depth to Water (ft)	11.22
Temperature (° C)	12.22
Specific Conductivity (mS/cm)	0.207
pH (standard units)	6.42
Dissolved oxygen (mg/L)	0.43
Turbidity (NTU)	2.47
Oxidation Reduction Potential (mV)	-11.0

Notes:
ft - feet
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
NTU - nephelometric turbidity units

Prepared by: CTM 10/06/201
Checked by: KRM 10/06/201

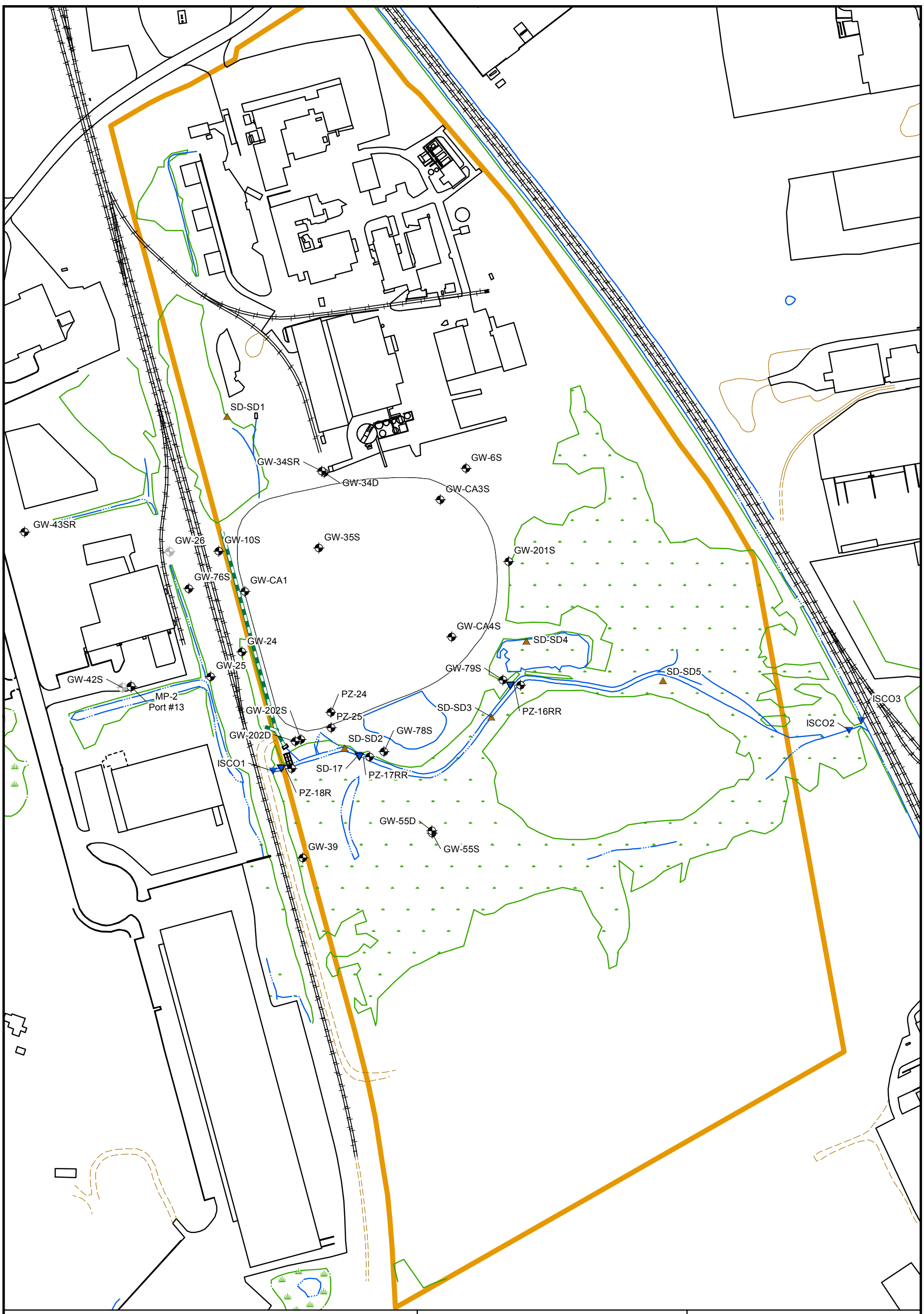
Table 9
Groundwater Laboratory Analytical Program
Plant B Monitoring Program
Second Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	µg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	µg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.07	µg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	0.40	µg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	µg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C12 Aliphatics	MA VPH	1.5	µg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C10 Aromatics	MA VPH	0.50	µg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.25	µg/L
Benzene	MA VPH	0.25	µg/L
Ethylbenzene	MA VPH	0.25	µg/L
m,p-Xylene	MA VPH	0.50	µg/L
o-Xylene	MA VPH	0.25	µg/L
Toluene	MA VPH	0.26	µg/L
Naphthalene	MA VPH	0.25	µg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
pH	SM 4500 H+ B	0.10	SU
Total Metals			
Iron, Total	SW846 6010B	19	µg/L
Filtered Metals			
Iron, Filtered	SW846 6010B	19	µg/L

Notes:
µg/L - micrograms per liter
mg/L - milligrams per liter
SU - standard units

Prepared by: CTM 10/06/2014
Checked by: KRM 10/06/2014

FIGURES



Legend

- Groundwater Monitoring Location
- Groundwater and Surface Water Monitoring Location
- Surface Water Location
- Sediment Sample Location
- Destroyed Monitoring Well
- Paved Road
- Unpaved Road
- Site Boundary
- Wetland Boundary
- Railroad
- Structure
- Water
- Culvert
- Trail

AMEC Environment & Infrastructure
107 Audubon Road Suite 301
Wakefield, MA 01880

N

0 90 180 360 Feet

Figure 1
Slurry Wall / Cap Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 07/31/13 | Checked/Date: CTM 07/31/13

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 1 - Slurry Wall Cap Monitoring Program Sampling Locations.pdf 7/31/2013 11:51 AM brian.roden

Legend

- CapSeams
- Monitoring Well

P-# = Perforations
T-# = Tear
W-# = Ponding Water

Note:
Figure based on changes since last inspection.

AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

N

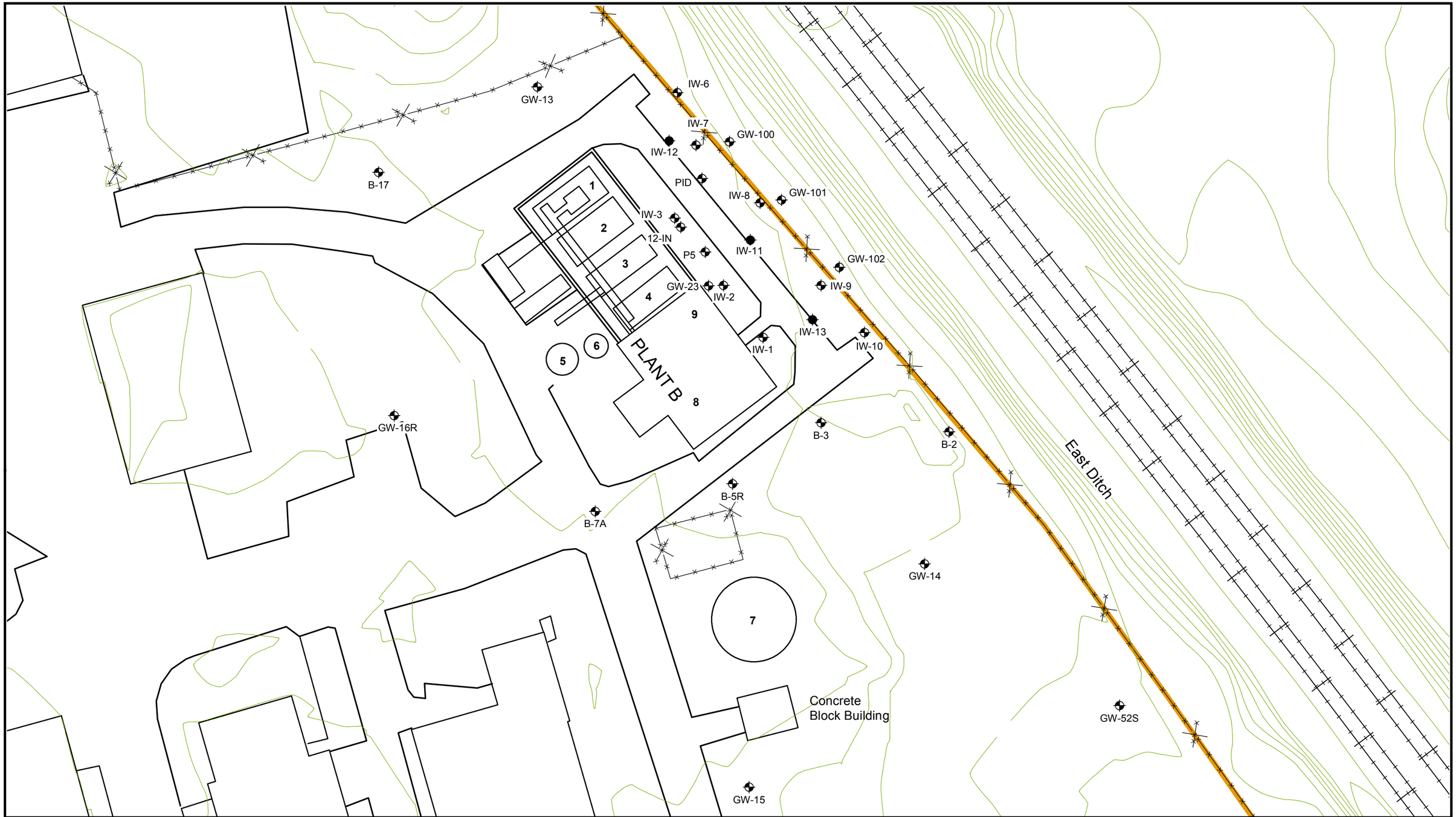
0 30 60 120 Feet

Figure 2
Second Quarter 2014 Temporary Cap Inspection Observations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared by BJR | Checked by CTM

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Olin_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\2014 Quarterly Sampling\2nd Quarter\Figures\Figure 2 - Second Quarter 2014 Temporary Cap Inspection Observations.pdf



Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Monitoring Well
- Recovery Well
- Elevation Contours

AMEC Environment & Infrastructure
107 Audubon Road Suite 301
Wakefield, MA 01880

N

0 15 30 60 Feet

Figure 3
Plant B Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 6/12/12 | Checked/Date: CTM 6/12/12

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\2011 Quarterly Sampling\November 2011\Report\Figures\Figure 3 - Plant B Monitoring Program Sampling Locations.pdf 6/19/2012

APPENDIX A

Field Data Records and Field Instrument Calibration Records

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/19/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: for Olin
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value	AM CALIBRATION Meter Value (Start Time: / End Time:)	AM CALIBRATION *Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time: / End Time:)	PM CALIBRATION CHECK Meter Value	PM CALIBRATION CHECK *Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	3.98	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		303	+/- 10 mV		259	+/- 10 mV
Conductivity	mS/cm	4.49	4.55	+/- 3% of standard	4.49	4.81	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	14.29	+/- 0.2 mg/L	--	10.31	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		9.73			15.97	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.5	10	10.4	+/- 5% of standard
Standard	NTU	20	20.1	20	20.2	
Standard	NTU	100	99.3	100	99.8	
Standard	NTU	800	780	800	789	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/20/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: for Olin
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time: / End Time:)	AM Meter Value	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time: / End Time:)	PM Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	4.02	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		317	+/- 10 mV		269	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.50	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L [1 (see Chart 1)]	--	9.33	+/- 0.2 mg/L	--	9.33	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		18.24			21.38	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.3	10	10.2	+/- 5% of standard
Standard	NTU	20	20.1	20	19.9	
Standard	NTU	100	99.6	100	97.8	
Standard	NTU	800	787	800	783	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/21/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: for Olin
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value	AM CALIBRATION Meter Value	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value	PM CALIBRATION CHECK Meter Value	*Acceptance Criteria (PM)
		Start Time:	End Time:		Start Time:	End Time:	
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	4.03	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		313	+/- 10 mV		253	+/- 10 mV
Conductivity	mS/cm	4.49	4.53	+/- 3% of standard	4.49	4.70	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	14.43	+/- 0.2 mg/L	--	10.04	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		10.86			20.98	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.2	10	10.0	+/- 5% of standard
Standard	NTU	20	20.2	20	19.7	
Standard	NTU	100	98.6	100	98.8	
Standard	NTU	800	798	800	778	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/22/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: for Olin
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value	AM CALIBRATION Meter Value	AM CALIBRATION *Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value	PM CALIBRATION CHECK Meter Value	PM CALIBRATION CHECK *Acceptance Criteria (PM)
		Start Time:	End Time:		Start Time:	End Time:	
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	3.98	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		282	+/- 10 mV		190	+/- 10 mV
Conductivity	mS/cm	4.49	4.50	+/- 3% of standard	4.49	4.80	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	13.20	+/- 0.2 mg/L	--	9.26	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		12.09			16.57	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.1	10	10.1	+/- 5% of standard
Standard	NTU	20	20.0	20	19.6	
Standard	NTU	100	99.6	100	99.4	
Standard	NTU	800	779	800	782	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/27/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE:
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

AM CALIBRATION — Start Time: End Time:

PM CALIBRATION CHECK — Start Time: End Time:

	Units	Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	3.98	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		314	+/- 10 mV		274	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.67	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	14.02	+/- 0.2 mg/L	--	10.00	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		11.83			17.69	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.1	10	10.3	+/- 5% of standard
Standard	NTU	20	20.0	20	19.8	
Standard	NTU	100	98.6	100	98.5	
Standard	NTU	800	785	800	783	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 5/29/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: Chris Mc for Olin
CHECKED BY: CTM DATE: 9/30/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time: / End Time:)	AM Meter Value	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time: / End Time:)	PM Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	4.01	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		336	+/- 10 mV		297	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.21	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L [1 (see Chart 1)]	--	9.80	+/- 0.2 mg/L	--	10.01	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		14.50			16.98	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.2	10	10.1	+/- 5% of standard
Standard	NTU	20	20.0	20	19.6	
Standard	NTU	100	98.7	100	97.6	
Standard	NTU	800	788	800	780	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

	Units	Standard Value	Meter Value	Standard Value	Meter Value	
Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

	Units	Standard Value	Meter Value	Standard Value	Meter Value	
Methane	%	50		50		+/- 10% of standard
O_2	%	20.9		20.9		+/- 10% of standard
H_2S	ppmv	25		25		+/- 10% of standard
CO	ppmv	50		50		+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto Cal Sol C-365894
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine C-365894	Pine C-365894
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-10S	ROUND NO.	2
SAMPLE ID	OC-GW-10S	SITE TYPE	Superfund	DATE	5/19/2014
TIME	START 9:25 END 9:50	JOB NUMBER	6107140016	BOTTLE TIME	9:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

INITIAL DEPTH TO WATER: 8.32 FT.

FINAL DEPTH TO WATER: Dry FT.

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

TOTAL VOL PURGED: 0.10 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

WELL DEPTH (TOR): 9.51 FT.

SCREEN LENGTH: 5 FT.

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PID AMBIENT AIR: N/A PPM

PID WELL MOUTH: N/A PPM

PRESSURE TO PUMP: N/A PSI

REFILL TIMER SETTING: N/A SEC.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

WELL DIAMETER: 1.5 IN.

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:30	--	120	14.00	0.129	5.92	10.91	6.92	62.0	~ 9 ft.	
9:35	Well dry									
9:40	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.1 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-24	ROUND NO.	2
SAMPLE ID	OC-GW-24	SITE TYPE	Superfund	DATE	5/19/2014
TIME	START 11:20 END 12:05	JOB NUMBER	6107140016	BOTTLE TIME	11:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

INITIAL DEPTH TO WATER: 2.31 FT.

FINAL DEPTH TO WATER: Dry FT.

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

TOTAL VOL. PURGED: 0.86 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

WELL DEPTH (TOR): 11.91 FT.

SCREEN LENGTH: N/A FT.

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PID AMBIENT AIR: N/A PPM

PID WELL MOUTH: N/A PPM

PRESSURE TO PUMP: N/A PSI

REFILL TIMER SETTING: N/A SEC.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

WELL DIAMETER: 1.5 IN.

WELL INTEGRITY:	YES	NO	N/A
CAP	X		
CASING	X		
LOCKED	X		
COLLAR	X		

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:25	2.31	--	10.51	0.411	7.98	6.01	31.2	-111	~ 11 ft.	
	Well dry									
11:40	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.86 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-25	ROUND NO.	2
SAMPLE ID	OC-GW-25	SITE TYPE	Superfund	DATE	5/19/2014
TIME	START 10:25 END 11:05	JOB NUMBER	6107140016	BOTTLE TIME	10:55

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 5.04 FT.

WELL DEPTH (TOR): 11.81 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 5.27 FT.

SCREEN LENGTH: 3 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: 0.02 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.013

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.56 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:30	5.27	200	15.40	0.844	5.99	6.58	2.47	4	~ 10 ft.	
10:35	5.27	200	14.89	0.838	6.55	1.08	1.13	-131		
10:40	5.27	200	14.75	0.838	6.63	0.61	1.12	-147		
10:45	5.27	200	14.47	0.837	6.68	0.27	1.12	-129		
10:50	5.27	200	14.32	0.833	6.68	0.01	1.50	-129		
10:55	5.27	200	14.26	0.839	6.68	> 0.00	1.42	-131		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[x] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[x] Ammonia-Nitrogen
[x] Chloride	300.0	4 DEG. C	1 X 125 mL	[x] Chloride
[x] Sulfate	300.0	4 DEG. C	1 X 125 mL	[x] Sulfate
[x] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[x] Specific Conductivity
[x] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[x] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.5 gal.

NOTES

SIGNATURE: Chris Mun for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-34SR	ROUND NO.	2
SAMPLE ID	OC-GW-34SR	SITE TYPE	Superfund	DATE	5/21/2014
TIME	START 11:35 END 12:25	JOB NUMBER	6107140016	BOTTLE TIME	12:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: DUP/ MS/ MSD

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER	6.35 FT.	WELL DEPTH (TOR)	17.06 FT.	PID AMBIENT AIR	N/A PPM
FINAL DEPTH TO WATER	6.35 FT.	SCREEN LENGTH	10 FT.	PID WELL MOUTH	N/A PPM
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	<0.01 GAL.	RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED	<0.01	PRESSURE TO PUMP	N/A PSI
TOTAL VOL. PURGED (purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)	1.40 GAL.			REFILL TIMER SETTING	N/A SEC.

WELL DIAMETER: 2 IN.

DISCHARGE TIMER SETTING: N/A SEC.

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:40	6.35	215	14.28	0.116	5.85	1.57	4.12	120	~ 15 ft.	
11:45	6.35	215	13.80	0.073	5.61	0.20	3.54	139		
11:50	6.35	215	13.83	0.065	5.62	0.92	3.73	145		
11:55	6.35	215	13.68	0.061	5.67	0.93	2.42	151		
12:00	6.35	215	13.72	0.061	5.70	0.92	1.44	152		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

NOTES

Includes MS, MSD, and DUP

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	OC-GW-34D	ROUND NO.	2
SAMPLE ID	OC-GW-34D	SITE TYPE	Superfund	DATE	5/21/2014
TIME	START 10:50 END 11:34	JOB NUMBER	6107140016	BOTTLE TIME	11:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.64 FT.

WELL DEPTH (TOR): 34.79 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.66 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.46 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:55	7.66	160	20.46	0.231	7.48	4.46	6.74	-5	~ 30 ft.	
11:00	7.66	160	16.60	0.211	7.00	1.43	2.85	27		
11:05	7.66	160	15.33	0.178	6.72	0.13	3.59	48		
11:10	7.66	160	15.04	0.170	6.64	>0.01	3.05	57		
11:15	7.66	160	15.03	0.164	6.60	>0.01	2.09	64		
11:20	7.66	160	14.86	0.163	6.58	>0.01	2.26	67		
11:25	7.66	160	14.83	0.163	6.57	>0.01	1.84	68		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[x] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[x] Ammonia-Nitrogen
[x] Chloride	300.0	4 DEG. C	1 X 125 mL	[x] Chloride
[x] Sulfate	300.0	4 DEG. C	1 X 125 mL	[x] Sulfate
[x] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[x] Specific Conductivity
[x] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[x] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-35S	ROUND NO.	2
SAMPLE ID	OC-GW-35S	SITE TYPE	Superfund	DATE	5/21/2014
TIME	START 9:55 END 10:35	JOB NUMBER	6107140016	BOTTLE TIME	10:20

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.07 FT.

WELL DEPTH (TOR): 19.52 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.35 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.04 GAL.
(initial - final x 0.16 {2-inch} or x 0.65 {4-inch})

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.04

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.00 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:00	7.33	155	19.39	1.26	6.83	5.96	20.4	-36	~ 17 ft.	
10:05	7.35	155	17.46	1.32	6.91	1.52	12.7	-73		
10:10	7.35	155	16.63	1.33	6.91	0.50	8.04	-80		
10:15	7.35	155	16.79	1.33	6.91	0.26	8.07	-84		
10:20	7.35	155	16.35	1.32	6.91	>0.01	8.09	-86		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-43SR	ROUND NO.	2
SAMPLE ID	OC-GW-43SR	SITE TYPE	Superfund	DATE	5/27/2014
TIME	START 8:30 END 9:10	JOB NUMBER	6107140016	BOTTLE TIME	9:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT: [X] TOP OF WELL RISER; [ ] TOP OF PROTECTIVE CASING; [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 6.52 FT.

WELL DEPTH (TOR): 18.42 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.52 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: // <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL PURGED: 1.40 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:35	6.52	180	15.59	0.997	4.86	5.24	4.33	260	~ 15 ft.	
8:40	6.52	180	14.76	0.982	5.00	0.58	4.14	256		
8:45	6.52	180	14.64	0.977	5.03	0.42	3.99	256		
8:50	6.52	180	14.51	0.973	5.11	0.13	3.89	255		
8:55	6.52	180	14.45	0.970	5.14	>0.01	2.58	255		
9:00	6.52	180	14.45	0.970	5.13	>0.01	1.97	257		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[X] GEOPUMP	[ ] LDPE (Dedicated)	[X] SILICON (Dedicated)	

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

LOCATION SKETCH

NOTES

SIGNATURE: for Olin

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-76S	ROUND NO.	2
SAMPLE ID	OC-GW-76S	SITE TYPE	Superfund	DATE	5/19/2014
TIME	START 8:05 END 9:05	JOB NUMBER	6107140016	BOTTLE TIME	8:55

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT: [ ] TOP OF WELL RISER [X] TOP OF PROTECTIVE CASING [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 7.73 FT.

WELL DEPTH (TOR): 15.08 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.73 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.63 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:10	7.73	125	11.39	0.584	5.93	4.30	<1000	72	~ 12 ft.	
8:15	7.73	125	11.13	0.554	6.05	0.16	<1000	22		
8:20	7.73	125	.10.99	0.481	6.10	>0.01	835	17		
8:25	7.73	125	10.92	0.443	6.09	>0.01	390	20		
8:30	7.73	125	10.85	0.386	6.08	>0.01	113	30		
8:35	7.73	125	10.93	0.371	6.04	>0.01	33.7	46		
8:40	7.73	125	10.89	0.360	6.03	>0.01	17.9	59		
8:45	7.73	125	11.08	0.346	6.03	>0.01	19.4	62		
8:50	7.73	125	11.09	0.347	6.01	>0.01	19.7	62		
8:55	7.73	125	11.10	0.344	5.99	>0.01	21.1	65		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.6 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-78S	ROUND NO.	2
SAMPLE ID	OC-GW-78S	SITE TYPE	Superfund	DATE	5/22/2014
TIME	START 8:50 END 9:25	JOB NUMBER	6107140016	BOTTLE TIME	9:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.41 FT.

WELL DEPTH (TOR): 10.33 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.61 FT.

SCREEN LENGTH: 9 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: 0.03 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.02

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.37 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:55	4.61	210	10.67	1.34	6.75	1.70	13.3	-6	~ 8 ft.	
9:00	4.61	210	10.17	1.33	6.71	>0.01	4.57	8		
9:05	4.61	210	10.02	1.33	6.69	>0.01	2.23	18		
9:10	4.61	210	9.95	1.33	6.69	>0.01	2.91	23		
9:15	4.61	210	9.85	1.33	6.65	>0.01	1.39	25		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.3 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-79S	ROUND NO.	2
SAMPLE ID	OC-GW-79S	SITE TYPE	Superfund	DATE	5/22/2014
TIME	START 11:00 END 11:40	JOB NUMBER	6107140016	BOTTLE TIME	11:30

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 3.55 FT.

WELL DEPTH (TOR): 11.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 3.55 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.72 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:05	3.55	220	16.63	2.24	6.42	1.44	21.1	-7	~ 8 ft.	
11:10	3.55	220	12.44	2.34	6.24	>0.01	21.7	-2		
11:15	3.55	220	12.24	2.34	6.22	>0.01	12.0	-2		
11:20	3.55	220	12.18	2.34	6.21	>0.01	9.05	-2		
11:25	3.55	220	12.17	2.33	6.21	>0.01	8.84	-2		
11:30	3.55	220	12.16	2.33	6.20	>0.01	8.72	-2		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.7 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-201S	ROUND NO.	2
SAMPLE ID	OC-GW-201S	SITE TYPE	Superfund	DATE	5/27/2014
TIME	START 9:40 END 10:25	JOB NUMBER	6107140016	BOTTLE TIME	10:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.07 FT.

WELL DEPTH (TOR): 14.96 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.23 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.03 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.02

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.30 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:45	4.23	140	13.56	3.17	6.39	1.76	10.5	198	~ 12 ft.	
9:50	4.23	140	13.17	3.16	6.43	0.50	6.12	182		
9:55	4.23	140	12.91	3.12	6.42	0.17	4.59	160		
10:00	4.23	140	12.71	3.08	6.42	0.02	3.62	140		
10:05	4.23	140	12.64	3.02	6.44	>0.01	1.97	110		
10:10	4.23	140	12.57	2.99	6.45	>0.01	2.14	107		
10:15	4.23	140	12.58	2.99	6.45	>0.01	2.02	102		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.3 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202S	ROUND NO.	2
SAMPLE ID	OC-GW-202S	SITE TYPE	Superfund	DATE	5/20/2014
TIME	START 10:50 END 11:25	JOB NUMBER	6107140016	BOTTLE TIME	11:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 6.28 FT.

WELL DEPTH (TOR): ~ 13.2 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.30 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.00 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:55	6.30	150	13.20	0.780	6.24	0.65	3.31	120.0	~ 10 ft.	
11:00	6.30	150	13.08	0.766	6.28	0.18	2.15	113.0		
11:05	6.30	150	12.94	0.762	6.29	>0.01	1.83	111.0		
11:10	6.30	150	12.94	0.770	6.29	>0.01	1.53	110.0		
11:15	6.30	150	12.96	0.776	6.29	>0.01	1.19	109.0		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

SIGNATURE: for Olin

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202D	ROUND NO.	2
SAMPLE ID	OC-GW-202D	SITE TYPE	Superfund	DATE	5/20/2014
TIME	START 9:50 END 10:45	JOB NUMBER	6107140016	BOTTLE TIME	10:20

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: DUP/ MS/ MSD

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 5.70 FT.

WELL DEPTH (TOR): 23.68 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 7.81 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.33 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.28

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.20 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:55	7.81	155	15.50	4.18	4.65	1.38	8.64	249	~ 20 ft.	
10:00	7.81	155	13.10	4.35	4.69	0.44	7.72	235		
10:05	7.81	155	13.09	4.31	4.70	0.30	7.20	234		
10:10	7.81	155	13.07	4.24	4.70	0.17	4.99	234		
10:15	7.81	155	13.03	4.20	4.70	0.05	4.88	234		
10:20	7.81	155	13.09	4.19	4.71	0.01	3.90	234		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED ~ 1.2 gal.

NOTES

Includes MS, MSD, and DUP

SIGNATURE: Chris Mahan for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-CA1	ROUND NO.	2
SAMPLE ID	OC-GW-CA1	SITE TYPE	Superfund	DATE	5/21/2014
TIME	START 8:55 END 9:45	JOB NUMBER	6107140016	BOTTLE TIME	9:35

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 6.68 FT.

WELL DEPTH (TOR): 9.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.68 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	—	—	—
CASING	—	—	—
LOCKED	—	—	—
COLLAR	—	—	—

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.87 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:00	6.68	180	15.89	0.860	7.11	9.27	102	-32	~ 7.0 ft.	
9:05	6.68	180	14.87	0.667	7.15	2.14	26.6	-34		
9:10	6.68	180	14.44	0.462	7.12	0.54	5.89	-18		
9:15	6.68	180	14.54	0.431	7.10	0.53	3.08	-9		
9:20	6.68	180	14.49	0.419	7.09	0.45	2.71	-1		
9:25	6.68	180	14.42	0.406	7.08	0.43	3.31	7		
9:30	6.68	180	14.43	0.402	7.09	0.23	1.50	11		
9:35	6.68	180	14.43	0.401	7.09	0.11	1.49	13		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP	TYPE OF TUBING	TYPE OF PUMP MATERIAL	TYPE OF BLADDER MATERIAL
[ ] QED BLADDER	[ ] TEFLON OR TEFLON LINED	[ ] POLYVINYL CHLORIDE	[ ] TEFLON
[ ] SIMCO BLADDER	[X] HIGH DENSITY POLYETHYLENE	[ ] STAINLESS STEEL	[ ] OTHER _____
[X] GEOPUMP	[ ] LDPE (Dedicated)	[X] SILICON (Dedicated)	

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED ~ 1.8 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
WELL ID: PZ-16RR
ROUND NO.: 2
SAMPLE ID: OC-PZ-16RR
SITE TYPE: Superfund
DATE: 5/22/2014
TIME START: 10:35 END: 11:00
JOB NUMBER: 6107140016
BOTTLE TIME: 10:50

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A
MEASUREMENT POINT: [ ] TOP OF WELL RISER [X] TOP OF PROTECTIVE CASING [ ] OTHER
PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.
PROTECTIVE CASING / WELL DIFFERENCE: -- FT.
INITIAL DEPTH TO WATER: 3.11 FT.
WELL DEPTH (TOR): 5.24 FT.
PID AMBIENT AIR: N/A PPM
WELL DIAMETER: 0.75 IN.
FINAL DEPTH TO WATER: Dry FT.
SCREEN LENGTH: 1 FT.
PID WELL MOUTH: N/A PPM
WELL INTEGRITY: CAP / CASING / LOCKED / COLLAR — YES / NO / N/A
DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))
RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A
PRESSURE TO PUMP: N/A PSI
TOTAL VOL. PURGED: 0.09 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)
REFILL TIMER SETTING: N/A SEC.
DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:40	3.11	--	16.62	1.42	7.17	8.51	16.7	-107	~ 5 ft.	Piezometer
	Well dry									
10:50	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP: [ ] QED BLADDER [ ] SIMCO BLADDER [X] GEOPUMP
TYPE OF TUBING: [ ] TEFLON OR TEFLON LINED [ ] HIGH DENSITY POLYETHYLENE [X] LDPE (Dedicated)
TYPE OF PUMP MATERIAL: [ ] POLYVINYL CHLORIDE [ ] STAINLESS STEEL [X] SILICON (Dedicated)
TYPE OF BLADDER MATERIAL: [ ] TEFLON [ ] OTHER

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO
NUMBER OF GALLONS GENERATED: ~ 0.09 gal.

NOTES

LOCATION SKETCH

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

SIGNATURE: for Olin

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-17RRR	ROUND NO.	2
SAMPLE ID	OC-PZ-17RRR	SITE TYPE	Superfund	DATE	5/22/2014
TIME	START 9:50 END 10:25	JOB NUMBER	6107140016	BOTTLE TIME	10:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 2.09 FT.

WELL DEPTH (TOR): 6.86 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.2 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:55	--	100	14.74	1.03	7.38	1.15	68.2	-162	~ 6 ft.	Piezometer
9:56	Well dry									
10:00	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED ~ 0.2 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-18R	ROUND NO.	2
SAMPLE ID	OC-PZ-18R	SITE TYPE	Superfund	DATE	5/21/2014
TIME	START 7:40 END 8:20	JOB NUMBER	6107140016	BOTTLE TIME	8:10

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 1.82 FT.

WELL DEPTH (TOR): 3.82 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1 IN.

FINAL DEPTH TO WATER: 2.59 FT.

SCREEN LENGTH: 1.6 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.03 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.04

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.78 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
7:45	2.46	100	14.38	3.30	6.15	3.75	27.3	53	~ 3.8 ft.	Piezometer
7:50	2.54	100	13.43	5.29	6.71	0.96	15.4	-100		
7:55	2.57	100	12.89	5.98	6.76	0.43	8.46	-127		
8:00	2.58	100	12.85	6.17	6.66	0.11	5.30	-110		
8:05	2.58	100	12.83	6.26	6.62	>0.01	5.30	-102		
8:10	2.59	100	12.99	6.27	6.60	>0.01	5.21	-102		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED: ~0.8 gal.

NOTES

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

SIGNATURE: for Olin

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-24	ROUND NO.	2
SAMPLE ID	OC-PZ-24	SITE TYPE	Superfund	DATE	5/22/2014
TIME	START 8:10 END 8:45	JOB NUMBER	6107140016	BOTTLE TIME	8:35

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.51 FT.

WELL DEPTH (TOR): 17.6 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.59 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.65 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:15	8.59	100	15.01	1.81	6.34	0.52	28.5	-23	~ 14 ft.	
8:20	8.59	100	14.23	1.81	6.41	0.26	27.5	-40		
8:25	8.59	100	14.17	1.80	6.42	0.16	22.8	-43		
8:30	8.59	100	14.07	1.80	6.45	>0.01	22.8	-48		
8:35	8.59	100	14.01	1.80	6.45	>0.01	21.9	-50		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.65 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-25	ROUND NO.	2
SAMPLE ID	OC-PZ-25	SITE TYPE	Superfund	DATE	5/20/2014
TIME	START 11:30 END 12:05	JOB NUMBER	6107140016	BOTTLE TIME	11:55

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.11 FT.

WELL DEPTH (TOR): 17.7 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.14 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.00 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:35	8.14	155	15.73	1.09	6.44	0.01	2.64	47	~ 14 ft.	
11:40	8.14	155	15.51	1.10	6.43	>0.01	1.92	40		
11:45	8.14	155	15.12	1.11	6.44	>0.01	0.98	35		
11:50	8.14	155	14.99	1.11	6.44	>0.01	0.61	34		
11:55	8.14	155	14.81	1.11	6.44	>0.01	1.14	35		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-16R	ROUND NO.	2
SAMPLE ID	OC-GW-16R	SITE TYPE	Superfund	DATE	5/29/2014
TIME	START 8:05 END 9:20	JOB NUMBER	6107140016	BOTTLE TIME	8:50

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 10.83 FT.

WELL DEPTH (TOR): 17.17 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 11.22 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP	___	___	___
CASING	___	___	___
LOCKED	___	___	___
COLLAR	___	___	___

DRAWDOWN VOLUME: 0.06 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.05

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.17 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:10	11.18	100	12.55	0.273	5.81	2.65	12.6	127	~ 15 ft.	
8:15	11.21	100	12.33	0.235	6.30	1.39	8.31	30		
8:20	11.22	100	12.26	0.225	6.37	1.08	5.60	10		
8:25	11.22	100	12.18	0.219	6.39	0.86	3.91	-1		
8:30	11.22	100	12.17	0.215	6.41	0.75	3.23	-5		
8:35	11.22	100	12.17	0.212	6.42	0.64	3.05	-8		
8:40	11.22	100	12.18	0.210	6.41	0.49	3.09	-10		
8:45	11.22	100	12.21	0.208	6.42	0.48	2.02	-10		
8:50	11.22	100	12.22	0.207	6.42	0.43	2.47	-11		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[X] VOCs
[X] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[X] SVOCs
[X] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[X] VPH
[X] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Fe
[X] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[X] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[ ] Chloride	300.0	4 DEG. C	1 X 500 mL	[ ] Chloride
[ ] Sulfate	300.0	4 DEG. C	1 X 500 mL	[ ] Sulfate
[ ] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[ ] Specific Conductivity
[ ] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.1 gal.

LOCATION SKETCH

NOTES

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

SIGNATURE: Ch [illegible] for Olin

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-ISCO1 | ACTIVITY TIME: START 12:18 END 12:25 | BOTTLE TIME: 12:20

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.5 ft.	SPEC. COND	0.624 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.80 ft.	D.O.	4.01 mg/L
TEMPERATURE	12.90 DEG C	SALINITY	--- %
TURBIDITY	4.57 NTU	ORP	86 mV
pH	6.35 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ] | TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-ISCO2 | ACTIVITY TIME: START 10:58 END 11:00 | BOTTLE TIME: 10:55

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.70 ft.	SPEC. COND	0.717 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.35 ft.	D.O.	7.22 mg/L
TEMPERATURE	13.72 DEG C	SALINITY	--- %
TURBIDITY	23.30 NTU	ORP	17 mV
pH	6.68 UNITS		

EQUIPMENT USED

- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER

- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ] | TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT

- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION

- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: _____ for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-ISCO3 | ACTIVITY TIME: START 10:40 END 10:49 | BOTTLE TIME: 10:45

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.70 ft.	SPEC. COND	0.760 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.35 ft.	D.O.	7.70 mg/L
TEMPERATURE	20.74 DEG C	SALINITY	--- %
TURBIDITY	6.58 NTU	ORP	38 mV
pH	6.64 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: Chr Mylar for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-PZ16RR | ACTIVITY TIME: START 11:00 END 11:15 | BOTTLE TIME: 11:10

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.60 ft.	SPEC. COND	0.754 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.30 ft.	D.O.	6.60 mg/L
TEMPERATURE	12.92 DEG C	SALINITY	--- %
TURBIDITY	14.4 NTU	ORP	16 mV
pH	6.70 UNITS		

EQUIPMENT USED

- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER

- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT

- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION

- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X]	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	[X]
[X]	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Chloride	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	[X]
[X]	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[X]	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[ ]						[ ]
[ ]						[ ]

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ]	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	[ ]
[ ]	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]

NOTES

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-PZ17RRR | ACTIVITY TIME: START 11:23 END 11:30 | BOTTLE TIME: 11:25

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.75 ft.	SPEC. COND	0.815 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.33 ft.	D.O.	6.60 mg/L
TEMPERATURE	12.85 DEG C	SALINITY	--- %
TURBIDITY	8.53 NTU	ORP	14 mV
pH	6.63 UNITS		

EQUIPMENT USED

- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER

- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT

- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION

- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X]	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	[X]
[X]	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Chloride	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	[X]
[X]	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[X]	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[ ]						[ ]
[ ]						[ ]

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ]	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	[ ]
[ ]	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]

NOTES

SIGNATURE: for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-PZ18R | ACTIVITY TIME: START 11:48 END 11:55 | BOTTLE TIME: 11:50

QC SAMPLES COLLECTED: DUP/ MS/ MSD

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.0 ft.	SPEC. COND	0.811 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.5 ft.	D.O.	3.73 mg/L
TEMPERATURE	13.43 DEG C	SALINITY	--- %
TURBIDITY	4.02 NTU	ORP	48 mV
pH	6.39 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES: Collected DUP/ MS/ MSD at 12:10

SIGNATURE: [signature] for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 5/29/2014

FIELD SAMPLE ID: OC-SW-SD17 | ACTIVITY TIME: START 11:33 END 11:40 | BOTTLE TIME: 11:35

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.58 ft.	SPEC. COND	0.816 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.29 ft.	D.O.	5.56 mg/L
TEMPERATURE	12.88 DEG C	SALINITY	--- %
TURBIDITY	8.65 NTU	ORP	22 mV
pH	6.56 UNITS		

EQUIPMENT USED

- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER

- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ] | TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT

- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION

- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED

- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: [signature] for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

APPENDIX B

Chains of Custody

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-60325 Chain of Custody

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Be	COC No: 480-48814-8585.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mas	Page: Page 1 of 2
Company: Olin Corporation			Job #:
Address: PO BOX 248	Due Date Requested:		
City: Charleston	TAT Requested (days):		
State, Zip: TN, 37310-0248			
Phone: 423-336-4012(Tel)	PO #: REWI0020		
Email: jmcashwell@olin.com	WO #:		
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annu	Project #: 48006612		
Site: Massachusetts	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - Di Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	360.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC-GW345R	5-21-14	12:00	G	W	Y		4	4	4	4	16	OC-GW345R
OC-GW340	5-21-14	11:25	G	W	Y		1	1	1	1	4	Includes MS,
OC-GW201S	5-21-14	10:20	G	W	Y		1	1	1	1	4	MSD, And Dup
OC-GW CA1	5-21-14	9:35	G	W	Y		1	1	1	1	4	
OC-PZ-18R	5-21-14	8:40	G	W	Y		1	1	1	1	4	
OC-GW202D	5-20-14	10:20	G	W	Y		4	4	4	4	16	OC-GW202D
OC-GW202S	5-22-14	11:15	G	W	Y		1	1	1	1	4	Includes MS, MSD
OC-PZ25	5-2014	11:55	G	W	Y		1	1	1	1	4	And Dup

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Brian Guichard	Date/Time: 5-21-14	Company	Received by:	Date/Time: 5-21-14 1520	Company TDC
Relinquished by:	Date/Time: 5-22-14	Company	Received by:	Date/Time: 5-22-14 0200	Company TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.2, 2.4 #1

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6/6/2014

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Quichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-48814-8585.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annu	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	S	D	N	X	
OC-GW 24	5-19-14	11:40	G	W	Y		1	1	1	1	4	
OC-GW 765	5-19-14	8:55	G	W	Y		1	1	1	1	4	
OC-GW 105	5-19-14	9:40	G	W	Y		1	1	1	1	4	
OC-GW 25	5-19-14	10:55	G	W	Y		1	1	1	1	4	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Brian Quichard	5-21-14			5-21-14 1520	TAC
2		5-21-14			5-22-14 0200	TAL
3		Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		2.2, 2.4 #1

Page 26 of 26

6/6/2014

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-60791 Chain of Custody

Client Information	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-48814-8585.1
Client Contact: Mr. James Cashwell	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 2
Company: Olin Corporation			Job #:

Address: PO BOX 248	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Charleston	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: TN, 37310-0248			
Phone: 423-336-4012(Tel)	PO #: REWI0020		
Email: jmcashwell@olin.com	WO #:		Other:
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annu	Project #: 48006612		
Site: Massachusetts	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
								N	S	D	N		
DC-GW 435R	5-27-14	9:60				Y		✓	✓	✓	✓	4	
OC-GW 201S	5-27-14	10:15				Y		✓	✓	✓	✓	4	
OC-PZ 24	5-22-14	8:35				Y		✓	✓	✓	✓	4	
OC-GW 78S	5-22-14	9:15				Y		✓	✓	✓	✓	4	
OC-PZ 17RR	5-22-14	10:00				Y		✓	✓	✓	✓	4	
OC-PZ 16RR	5-22-14	10:50				Y		✓	✓	✓	✓	4	
OC-GW 79S	5-22-14	11:30				Y		✓	✓	✓	✓	4	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Bruce Cashwell				5-23-14 1350	TAL
2		5-23-14 1650			5-23-14 0100	TAL
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.4, 2.7 #1

6/19/2014

480-60789 Chain of Custody

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Info	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-48725-12290.1
Client Contact: Mr. Brian Guichard	Phone: 908 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #

Address: 51 Eames street	Due Date Requested:	
City: Wilmington	TAT Requested (days):	
State, Zip: MA, 01887		
Phone: 423-336-4012(Tel)	PO #: REWI0020	
Email: beguichard@olin.com	WO #:	
Project Name: Plant B Quarterly Event Desc: Plant B quarterly(March/May/Augu	Project #: 48006612	
Site: Massachusetts	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	360.1 - Ammonia	6010MCP - Iron	MAVPH - MA VPH	8260MCP - TMP 8260	8270_LL_MCP - NDPA/BEHP 8270LL	SM4500_H+ - pH								Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	A	N	N									
OC-GW-16R	5-29-14	8:50	G	Water			✓	✓	✓	✓	✓	✓								11	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:	
Relinquished by: Brian Guichard	Date/Time:	Company	Received by:	Date/Time: 5-29-14 1350	Company TAL
Relinquished by:	Date/Time: 5-29-14 1650	Company	Received by:	Date/Time: 5-30-14 0100	Company TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.4 #1

7/24/2014

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-60792 Chain of Custody

Client Information	Sampler: Brian Guichard	Carrier Tracking No(s):	COC No: 480-48812-12963.1
Client Contact: Mr. Brian Guichard	Phone: 5-29-14		Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days):		
State, Zip: MA, 01887			
Phone: 423-336-4012(Tel)	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Surfacwater Quarterly Event Desc: Surfacewater Quarterly (May/	Project #: 48006612		
Site: Massachusetts	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr/Na Total	6010MCP - Al/Cr/Na Dissolved Field Filtered	2510B, 353.2, 353.2_Nitrite, Nitrate_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	D	N		
OC-ISCO1	5-29-14	12:20	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-ISCO2		10:55	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-ISCO3		10:45	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-PZ-16RRSW		11:10	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-PZ-17RRSW		11:25	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-PZ-18RSW		11:50	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-SD-17		11:35	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-DUP SW PZ18 RSW		12:10	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-PZ18RSW MS		12:10	G	Water	✓		✓	✓	✓	✓	✓	6	
OC-PZ18RSW MSD		12:10	G	Water	✓		✓	✓	✓	✓	✓	6	
				Water									

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Brian Guichard			[signature]	5-29-14 1350	TA
[signature]	5-29-14 1630		[signature]	5-30-14 0100	TA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.7, 2.8, 2.2 #1

6/16/2014

APPENDIX C

Second Quarter 2014
Temporary Cap Inspection Photo Log

Photo 1: General Cap Photo and Drain Area

Photo 2: Tear (needs repair)

Photo 3: Tear on Cap (needs repair)

Photo 4: Large Tear on Cap (needs repair)

APPENDIX A

Interim Response Steps Field Activity Reports

A-2 Third Quarter 2014 Sampling Event

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
THIRD QUARTER 2014 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT
THIRD QUARTER 2014 SAMPLING EVENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

Prepared for:

Olin Corporation
3855 North Ocoee St., Suite 200
Cleveland, Tennessee 37312

Prepared By:

AMEC Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, Massachusetts 01824

AMEC PROJECT NO. 6107140016.04

December 29, 2014

Peter H. Thompson
Project Manager

Michael J. Murphy
Project Principal

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Table 2 Groundwater Elevations – Slurry Wall/Cap Monitoring Program
Table 3 Final Field Parameters for Groundwater Sampling – Slurry Wall/Cap Monitoring Program
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Table 5 Final Field Parameters for Surface Water Sampling – Slurry Wall/Cap Monitoring Program
Table 6 Surface Water Analytical Program – Slurry Wall/Cap Monitoring Program
Table 7 Groundwater Elevations – Plant B Monitoring Program
Table 8 Final Field Parameters for Groundwater Sampling – Plant B Monitoring Program
Table 9 Groundwater Laboratory Analytical Program – Plant B Monitoring Program

FIGURES

Figure 1 Slurry Wall/Cap Monitoring Program Sampling Locations
Figure 2 Third Quarter 2014 Temporary Cap Inspection Observations
Figure 3 Plant B Monitoring Program Sampling Locations

APPENDICES

Appendix A Field Data Records and Field Instrument Calibration Records
Appendix B Chains of Custody
Appendix C Third Quarter 2014 Temporary Cap Inspection Photo Log

GLOSSARY OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
DO	Dissolved Oxygen
IRSWP	Interim Response Steps Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MACTEC	MACTEC Engineering and Consulting, Inc.
NTU	Nephelometric Turbidity Units
ORP	Oxidation/Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
SC	Specific Conductivity
TAL	TestAmerica Laboratories, Inc.
USEPA	United States Environmental Protection Agency
UV	Ultraviolet

1.0 INTRODUCTION

On behalf of the Olin Corporation (Olin), AMEC Environment & Infrastructure, Inc. (AMEC) presents this summary report for field activities completed in association with the Third Quarter 2014 groundwater and surface water monitoring as well as the cap inspection for the Slurry Wall/Cap Monitoring Program and Plant B Monitoring Program. These activities were conducted consistent with the requirements and procedures contained in the Final Interim Response Steps Work Plan (IRSWP), Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts dated August 8, 2008 and the Volume IIIB, the Quality Assurance Project Plan, of the Final Remedial Investigation/Feasibility Study (RI/FS) Work Plan dated August 14, 2009 (MACTEC Engineering and Consulting, Inc. [MACTEC], 2009).

1.1 Limitations

This report, including its findings, opinions, and conclusions, is intended for the exclusive use and benefit of, and may be relied upon only by Olin Corporation and the United States Environmental Protection Agency (USEPA).

2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Program is to monitor the concentrations of select constituents in groundwater and surface water in areas adjacent to and within the South Ditch and to monitor the physical condition of the temporary cap at the Containment Area of the former Olin Facility located at 51 Eames Street, Wilmington, Massachusetts.

The Third Quarter 2014 groundwater and surface water monitoring program includes collecting groundwater level measurements from select monitoring wells and piezometers, collecting and analyzing groundwater samples from five monitoring wells and five piezometers and collecting and analyzing surface water samples from seven locations within the East Ditch and South Ditch. Groundwater and surface water sample locations are listed in **Table 1** and shown on **Figure 1**. The groundwater and surface water sampling program is further described in the Final IRSWP (MACTEC, 2008), which has been approved by the USEPA.

2.1 Scope of Work

The Slurry Wall/Cap Monitoring Program for this sampling event consists of: collecting groundwater level measurements in the vicinity of the South Ditch area; collecting and analyzing groundwater samples from the following monitoring wells: GW-25, GW-78S, GW-79S, GW-202S, and GW-202D; and piezometers: PZ-16RR, PZ-17RRR, PZ-18R, PZ-24, and PZ-25; collecting and analyzing surface water samples from the following locations: ISCO-1, ISCO-2, ISCO-3, SD-17, PZ-16RR, PZ-17RRR, and PZ-18R; inspecting and documenting the condition of the temporary cap; and downloading water level and barometric pressure data from data loggers that have been installed in the following wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S. Monitoring wells, piezometers, and surface water sample locations are shown on **Figure 1**.

2.1.1 Groundwater Level Measurement

On August 25, 2014, Olin personnel completed a site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program and collected groundwater level measurements. This included measuring depth to groundwater from 22 monitoring wells and piezometers using a water interface probe. Groundwater level measurements and calculated groundwater elevations are summarized in **Table 2**.

2.1.2 Groundwater Sampling

On August 19-21, 2014, Olin personnel sampled groundwater from five monitoring wells and five piezometers using 2010 USEPA low stress (low flow) groundwater sampling methods.

Prior to low flow sampling, a Horiba U-52 water quality meter and a Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instruments calibration records are contained in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at each monitoring location. During sampling activities, the purged groundwater was

continuously monitored using the multi-parameter water quality meter for pH, temperature, specific conductivity (SC), dissolved oxygen (DO), and oxidation/reduction potential (ORP), while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at each location until these field parameters stabilized as indicated in Appendix A of the IRSWP.

No readings were noted outside the 2010 USEPA low flow stabilization guidelines. Monitoring locations PZ-16RR and PZ-17RRR went dry upon purging and could not be low flow sampled. Locations that draw down are typically purged dry and sampled upon recharging. The final low flow purging field parameter measurements are presented in **Table 3**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon stabilization of groundwater parameters, groundwater samples were collected by directly filling the laboratory prepared sample bottles. A 0.45-micron pore diameter, in-line Teflon™ filter was used to field filter groundwater for dissolved metal analysis in accordance with the IRSWP. The samples were placed on ice and transferred to TestAmerica Laboratories, Inc. (TAL) of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in **Table 4**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

Purged groundwater from each monitoring well was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

2.1.3 Surface Water Sampling

On August 26, 2014, Olin personnel collected seven surface water samples from downstream to upstream from the East Ditch and South Ditch. The locations are identified as ISCO-3, ISCO-2, PZ-16RR, PZ-17RRR, SD-17, PZ-18R, and ISCO-1 as shown on **Figure 1**.

Before field activities began, Horiba U-52 water quality meter and Hach 2100Q turbidity meter were properly calibrated to monitor surface water quality parameters at each location. The calibration records can be found in **Appendix A**. No readings were noted outside the manufacturer calibration ranges.

At each of the seven field locations, surface water parameter measurements (pH, temperature, SC, ORP, DO, and turbidity) were collected. Readings were collected by directly submersing the Horiba probe into the surface water until parameter stabilization. The final surface water field parameters are summarized in **Table 5**. Field data records from each surface water sample location are attached in **Appendix A**.

Filtered surface water samples (for dissolved metals analysis) were collected by submerging dedicated tubing attached to a peristaltic pump into the water (approximately from 0.1 feet to 0.6 feet into the surface water). A peristaltic pump was used to reduce the entrapment of floating or suspended sediment and provide positive pressure for field filtering the water through the 0.45-micron pore diameter filter for dissolved metal analysis.

Surface water samples were collected by directly filling the laboratory prepared glassware. The samples were then placed on ice for delivery to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses summarized in **Table 6**. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

2.1.4 Data Logger Data Download

Data loggers are deployed in 10 monitoring wells and piezometers: GW-10S, GW-35S, GW-CA1, GW-76S, GW-78S, GW-CA3S, GW-CA4S, PZ-24, PZ-25, and GW-6S, to continuously monitor groundwater elevation proximate to the cap area. AMEC downloaded data from the 10 data loggers, along with data from the barometric pressure data logger deployed in GW-35S. Downloaded data from the loggers are presented in the January 2015 Semi-Annual Status Report.

2.1.5 Cap Inspection

The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness (**Figure 2**). These sheets were factory fabricated with double welded seams from smaller, narrower panels. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) - resistant thread. The original temporary cap was installed in 2001 and consisted of a 6 mil thick sheet. Due to deterioration of the 6 mil sheet, it was replaced by the current 8 mil thick cover in 2003. The 8 mil cover was placed directly over the 6 mil cover and re-ballasted with sand bags to resist wind uplift. Quarterly inspections of the 8 mil cover were instituted in 2003 to evaluate the need for periodic maintenance and to document maintenance and repair activities.

On August 20, 2014, AMEC field personnel, Nobis Engineering, Inc., and the Massachusetts DEP, performed a visual inspection of the Temporary Cap surface. Photographs taken during the inspection are presented in **Appendix C**. In general, the temporary cap was observed to be in good condition with the exception of several perforations. Many of the repairs previously completed by Olin personnel appeared to be intact. Major repairs (re-stitching the cap panels, replacing and adding sandbags; and adding ballast along the perimeter) appear to be in good condition. The temporary cap surface contains: areas of sediment from previously deteriorated sand bags; small areas of vegetation; small pools of water; and several minor tears. AMEC also observed some minor fraying on the edges of some sheets that do not compromise the welded seams. AMEC's observations are summarized in **Figure 2**. Temporary cap monitoring activities are summarized below.

2.1.5.1 Activities Completed During This Inspection

- Walking and inspecting the sewn seams for evidence of deterioration of the UV–resistant thread.
- Observing areas of sewn seams in low spots.
- Checking sand bags and other areas where vegetation is growing to verify the roots have not penetrated the polyethylene cover.

- Providing photo-documentation of typical cap conditions.

2.1.5.2 Observations During This Inspection

- The scrim reinforced polyethylene cover remains flexible and is generally in good condition; however, several areas were observed where the scrim reinforcement thread (in the polyethylene sheet) was exposed.
- Sewn seams utilizing UV-resistant thread are intact and do not show signs of deterioration.
- AMEC observed several tears and perforations along cap surface, as well as minor tears around the bases of the monitoring wells within the cap area. These locations were identified to the Olin on-Site manager for repair by Olin as part of normal maintenance.
- Several sandbags were observed to be not securely tied.
- Wild seeding from surrounding areas has resulted in vegetation outgrowths from under sand bags and low levels and vegetation growing above the cap surface. These plant roots, where observed, do not appear to penetrate the underlying polyethylene sheet; however, it is recommended this vegetation be removed.
- Small areas of standing water were observed on the cap surface, including surrounding the main drain.
- The gravel ballast placed along the perimeter of the cap remains in place.
- Although some patches of vegetation surround the cap internal drain grate, they do not appear to impede the active draining of standing water from the cap surface.
- Water was observed between the two “cap” membranes located west of the drainage grate.

2.1.5.3 Discussion

The general physical condition of the cap membrane and sewn seams appear in good condition considering its age and direct exposure to sunlight and the elements.

The areas of vegetation growth that exist above the cap surface do not appear to affect the polyethylene sheeting. The polyethylene sheet continues to perform its intended function as the UV protection provided by its carbon black content has protected the polymer from significant deterioration.

Olin site personnel have repaired perforations and minor damage to the cap with a polyethylene repair tape with mastic backing. These repairs were generally observed to be in good condition. Olin continues to repair locations observed by AMEC that require resealing.

2.1.5.4 Recommendations

It is recommended that the current program of cap inspections and maintenance (including: patching the perforations noted during the cap inspection; inspecting the internal drain and removing vegetation within the drain grate; removing vegetation growing on the cap; and visually monitoring the cap for future changes in condition) be continued.

3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor groundwater quality at select monitoring wells and conduct gauging activities to determine groundwater elevations and light non-aqueous phase liquid (LNAPL) thickness.

3.1 Scope of Work

The Third Quarter Plant B Monitoring Program consisted of measuring groundwater levels in 28 monitoring wells within the Plant B area, gauging LNAPL thickness in monitoring wells where LNAPL was observed, and USEPA low flow (low stress) groundwater sampling at monitoring well GW-16R. Groundwater monitoring wells from the Plant B Monitoring Program are listed in **Table 7** and the monitoring well locations are shown on **Figure 3**.

3.1.1 Groundwater Level Measurements and LNAPL Gauging

On August 29, 2014, Olin personnel completed a site reconnaissance of the monitoring well locations in the Plant B Monitoring Program and collected groundwater level measurements and LNAPL thickness measurements. Depth to groundwater was measured in 28 monitoring wells using a water interface probe. For wells with observed LNAPL, LNAPL thickness was measured using an oil/water interface probe. Groundwater level measurements, groundwater elevations, and LNAPL thickness measurements are summarized in **Table 7**.

3.1.2 Groundwater Sampling

On August 26, 2014, Olin personnel sampled groundwater from monitoring well GW-16R following the 2010 USEPA low stress (low flow) groundwater sampling method.

Prior to low flow sampling, a Horiba U-52 water quality meter and Hach 2100Q turbidity meter were calibrated according to the instrument manufacturer's specifications using certified calibration solutions. The field instrument calibration record is contained in **Appendix A**. A calibration check was also performed at the end of each day and is recorded on the calibration records. No readings were noted outside the manufacturer calibration ranges.

Groundwater was purged using an adjustable rate peristaltic pump along with dedicated tubing at the sample location. During sampling activities, the purged groundwater was continuously monitored using the Horiba U-52 multi-parameter water quality meter for pH, temperature, SC, DO, and ORP, while turbidity was monitored using the Hach 2100Q turbidity meter. Well purging continued at the sample location until these field parameters stabilized as indicated in Appendix A of the IRSWP. No readings were noted outside the 2010 USEPA low flow stabilization guidelines. The final low flow purging field parameter measurements are presented in **Table 8**. Field data records for each groundwater monitoring location are attached in **Appendix A**.

Upon groundwater stabilization, groundwater samples were collected by directly filling the laboratory prepared glassware. The samples were placed on ice, and were transferred to TAL of Westfield, Massachusetts, under chain-of-custody for chemical analyses as summarized in

Table 9. Copies of the chain-of-custody documents are provided in **Appendix B**. Laboratory analytical data will be presented in the January 2015 Semi-Annual Status Report.

Purged groundwater from sampling activities was collected in collapsible plastic containers, transported to the Block House building, adjacent to the Plant B groundwater treatment building, and containerized in a secured 55-gallon drum. Olin characterizes and disposes of that material in accordance with applicable regulations.

4.0 REFERENCES

MACTEC Engineering and Consulting, Inc. (MACTEC), August 8, 2008. *Final Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts.

MACTEC, August 14, 2009. Final RI/FS Work Plan, Olin Chemical Superfund Site, Wilmington, Massachusetts.

TABLES

Table 1
Groundwater and Surface Water Sampling Locations
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Groundwater	Surface Water
GW-25	ISCO1
GW-78S	ISCO2
GW-79S	ISCO3
GW-202S	PZ-16RR
GW-202D	PZ-17RRR
PZ-16RR	PZ-18R
PZ-17RRR**	SD-17
PZ-18R	
PZ-24	
PZ-25	
GW-16R*	

Notes:
* - Plant B Monitoring Well
** - Piezometer replaced in South Ditch

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

Table 2
Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation	Depth to Water (1, 2)	Groundwater Elevation (3)	Notes	Date Measured
I.D.	(ft msl)	(ft)	(feet NGVD)		8/25/2014
GW-10S	89.10	5.51	83.59	TOC	
GW-24	83.43	2.52	80.91		
GW-25	85.97	5.27	80.70		
GW-26*	84.93	*	---		
GW-34D	90.36	7.81	82.55		
GW-34SR	89.13	6.56	82.57		
GW-35S	88.51	7.27	81.24		
GW-39	83.64	3.85	79.79		
GW-42S**	84.18	**	---		
GW-43SR	87.86	6.72	81.14		
GW-55D	81.95	2.77	79.18		
GW-55S	81.70	2.29	79.41		
GW-76S	88.45	7.91	80.54	TOC	
GW-78S	84.89	4.63	80.26		
GW-79S	81.54	4.31	77.23		
GW-201S	83.29	4.26	79.03		
GW-202D	86.52	6.02	80.50		
GW-202S	86.97	6.61	80.36		
GW-CA1	88.01	6.85	81.16		
PZ-16RR/IN	81.00	3.70	77.30		
PZ-16RR/OUT (4)	81.00	Dry	---		
PZ-17RRR/IN	***	2.49	---		
PZ-17RRR/OUT (4)	***	2.49	---		
PZ-18R/IN	82.42	1.99	80.43		
PZ-18R/OUT (4)	82.42	1.98	80.44		
PZ-24	89.43	8.80	80.63		
PZ-25	88.90	8.41	80.49		

Notes:

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

(1) - Measurement from top of PVC. If no PVC, measurement from TOC
(2) - Collected using a Solinst water interface probe
(3) - Groundwater Elevation = Reference Elevation - Depth to Water
(4) - Reported elevation of surface water adjacent to piezometer
TOC - Water level measurement taken from Top of Casing
* - Well removed for detention basin construction
** - Well destroyed during paving
*** - Piezometer replaced in South Ditch. Not surveyed
msl - mean sea level
ft - feet

Table 3
Final Field Parameters for Groundwater Sampling
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Quarterly Slurry Wall/Cap Monitoring Well Samples					
Location	GW-25	GW-78S	GW-79S	GW-202S	GW-202D
Date	8/21/2014	8/19/2014	8/20/2014	8/19/2014	8/20/2014
Depth to Water (ft)	5.49	4.86	4.39	6.62	6.11
Temperature (° C)	17.22	17.14	15.69	16.18	17.89
Specific Conductivity (mS/cm)	0.794	1.17	1.38	0.709	3.48
pH (standard units)	7.09	6.51	6.03	6.15	4.54
Dissolved oxygen (mg/L)	< 0.01	5.40	< 0.01	< 0.01	0.19
Turbidity (NTU)	1.05	1.85	2.87	1.23	7.94
Oxidation Reduction Potential (mV)	-168.0	-8.0	-4.0	101.0	245.0

Quarterly Slurry Wall/Cap Piezometer Samples					
Location	PZ-16RR	PZ-17RRR	PZ-18R	PZ-24	PZ-25
Date	8/20/2014	8/21/2014	8/20/2014	8/19/2014	8/19/2014
Depth to Water (ft)	Dry	Dry	2.57	8.86	8.45
Temperature (° C)	20.10	17.94	18.69	17.75	17.10
Specific Conductivity (mS/cm)	1.04	0.488	1.79	1.82	1.16
pH (standard units)	7.02	6.99	6.80	6.41	6.31
Dissolved oxygen (mg/L)	2.14	4.75	3.31	< 0.01	< 0.01
Turbidity (NTU)	892	238	1.95	4.09	1.77
Oxidation Reduction Potential (mV)	-113.0	-91.0	-125.0	-77.0	-16.0

Notes:
ft - feet
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
NTU - nephelometric turbidity units
mV - millivolts

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

Table 4
Groundwater Laboratory Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Chloride	EPA 300.0	0.40	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.13	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	60	µg/L
Chromium, filtered	SW846 6010B	1.0	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

Table 5
Final Field Parameters for Surface Water Sampling
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Surface Water Samples							
Location	ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RRR	PZ-18R	SD-17
Date	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014
Depth of Water (ft)	0.60	0.10	0.20	0.15	0.35	0.50	0.35
pH (standard units)	6.11	6.46	6.66	6.39	5.77	6.22	5.36
Specific Conductivity (mS/cm)	0.884	0.752	0.775	2.30	2.22	0.851	1.94
Dissolved oxygen (mg/L)	2.68	3.51	8.43	4.78	3.90	4.17	3.05
Temperature (° C)	19.45	21.70	22.82	28.18	18.37	19.37	18.13
Turbidity (NTU)	3.11	4.52	5.46	10.9	34.3	5.01	13.4
Oxidation Reduction Potential (mV)	88.0	-18.0	73.0	15	104.0	77.0	109.0

Notes:
ft - feet
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
NTU - nephelometric turbidity units
mV - millivolts

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

Table 6
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
Nitrate	EPA 300.0	0.02	mg/L
Nitrite	EPA 300.0	0.02	mg/L
Chloride	EPA 300.0	0.40	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	0.13	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	60	µg/L
Chromium, Total	SW846 6010B	1.0	µg/L
Sodium, Total	SW846 6010B	320	µg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	60	µg/L
Chromium, Filtered	SW846 6010B	1.0	µg/L
Sodium, Filtered	SW846 6010B	320	µg/L

Notes:
mg/L - milligrams per liter
µmhos/cm - micromhos per centimeter
µmhos/cm = µS/cm (microSiemens per centimeter)
1 µS/cm = 0.001 mS/cm (milliSiemens per centimeter)
µg/L - micrograms per liter

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

Table 7
Groundwater Elevations
Plant B Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation (1)	Depth to Water (2)	Depth to Product (3)	Product Thickness (4)	Groundwater Elevation (5)	Date Measured
I.D.	(ft msl)	(ft)	(ft)	(ft)	(feet NGVD)	8/29/2014
B-2	90.48	11.83	NPD	NA	78.65	
B-3	90.32	11.40	NPD	NA	78.92	
B-5R	91.38	11.69	NPD	NA	79.69	
B-7A	88.81	8.23	NPD	NA	80.58	
B-17	91.55	10.18	NPD	NA	81.37	
GW-13	90.57	11.68	NPD	NA	78.89	
GW-14	88.70	9.44	NPD	NA	79.26	
GW-15	90.01	9.12	NPD	NA	80.89	
GW-16R	92.46	11.92	NPD	NA	80.54	
GW-23	91.04	11.89	11.84	0.05	79.20	
GW-52S	87.95	8.93	NPD	NA	79.02	
GW-100	90.15	11.71	NPD	NA	78.44	
GW-101	90.14	11.73	NPD	NA	78.41	
GW-102	89.00	10.52	NPD	NA	78.48	
IW-1	90.71	11.87	NPD	NA	78.84	
IW-2	90.53	11.92	11.92	0	78.61	
IW-3	90.76	12.05	12.05	0	78.71	
IW-6	89.15	10.96	NPD	NA	78.19	
IW-7	90.10	11.85	NPD	NA	78.25	
IW-8	89.94	11.63	NPD	NA	78.31	
IW-9	89.78	11.33	NPD	NA	78.45	
IW-10	90.43	11.87	NPD	NA	78.56	
IW-11	89.92	13.28	13.25	0.03	76.67	
IW-12	90.31	13.50	NPD	NA	76.81	
IW-13	89.90	19.33	19.33	0	70.57	
PID	89.97	11.69	11.69	0	78.28	
P5	90.45	11.93	11.93	0	78.52	
12-IN	89.84	11.14	11.14	0	78.70	

Notes:

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

(1) - Reference elevations surveyed 11/97. New TOC survey by Dana Perkins 4-5/98
(2) - Top of PVC. If no PVC, measurement from top of steel casing
(3) - Collected using a Solinst water interface probe or Geotech oil/water interface probe
(4) - Sheen noted with a product thickness of 0.01 feet
(5) - Groundwater Elevation = Reference Elevation - (Depth to Water - (Product Thickness x 0.95))
TOC - Top of Casing
NPD - No Product Detected
NA - Not Applicable
NGVD - National Geodetic Vertical Datum
msl - mean sea level
ft - feet
East Ditch - No sheen noted; Observed OK

Table 8
Final Field Parameters for Groundwater Sampling
Plant B Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Plant B Monitoring Well Samples	
Location	GW-16R
Date	8/26/2014
Depth to Water (ft)	12.29
Temperature (° C)	19.57
Specific Conductivity (mS/cm)	0.208
pH (standard units)	6.27
Dissolved oxygen (mg/L)	1.98
Turbidity (NTU)	2.76
Oxidation Reduction Potential (mV)	-10.0

Notes:
ft - feet
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
NTU - nephelometric turbidity units
mV - millivolts

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

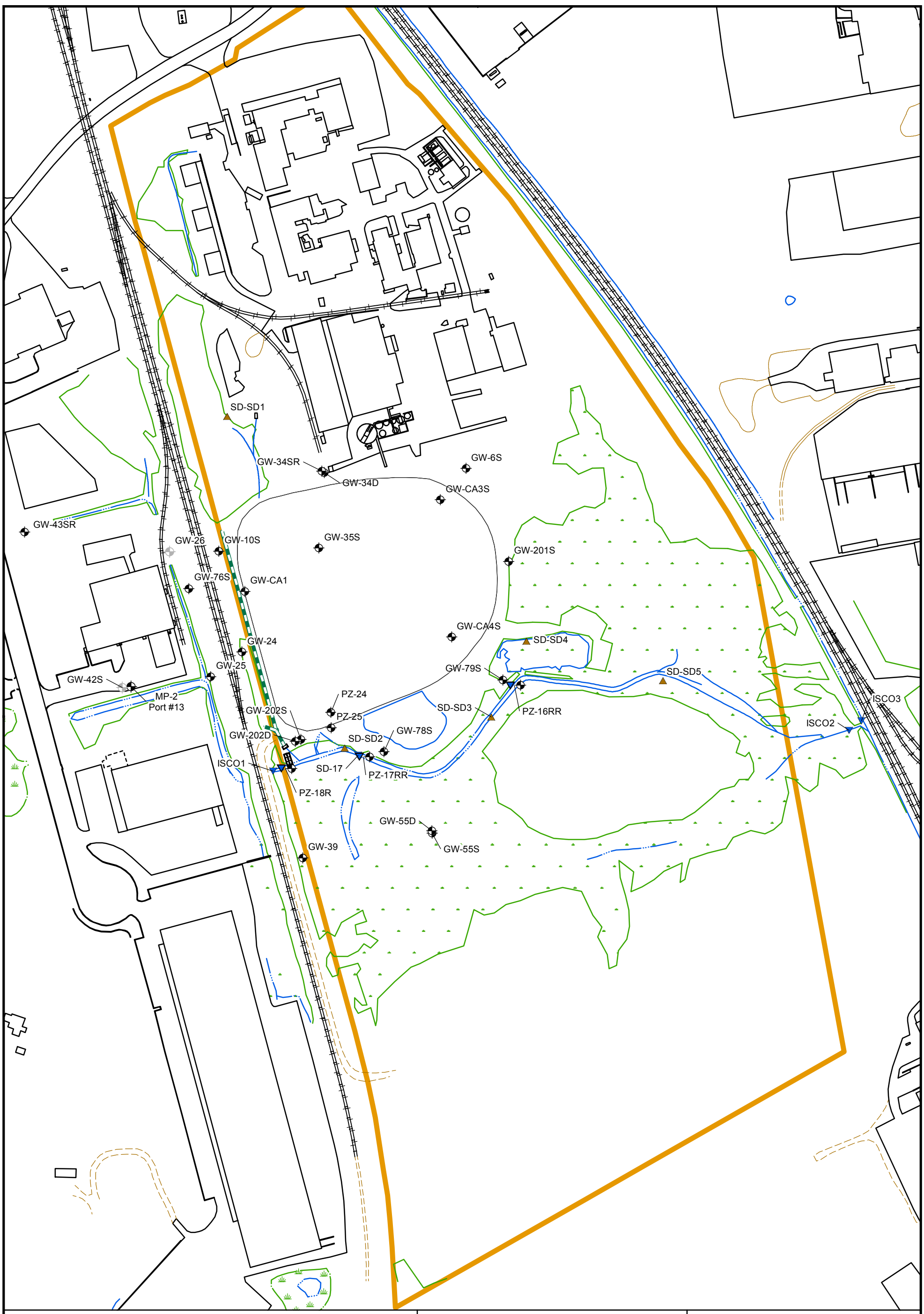
Table 9
Groundwater Laboratory Analytical Program
Plant B Monitoring Program
Third Quarter 2014 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	0.40	µg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	0.43	µg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	0.32	µg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	1.7	µg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	1.5	µg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C12 Aliphatics	MA VPH	1.5	µg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	1.5	µg/L
C9-C10 Aromatics	MA VPH	0.50	µg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	0.26	µg/L
Benzene	MA VPH	0.26	µg/L
Ethylbenzene	MA VPH	0.26	µg/L
m,p-Xylene	MA VPH	0.50	µg/L
o-Xylene	MA VPH	0.26	µg/L
Toluene	MA VPH	0.26	µg/L
Naphthalene	MA VPH	0.26	µg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	EPA 350.1 (10-107-06-1-K)	0.10	mg/L
pH	SM 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	19	µg/L

Notes:
µg/L - micrograms per liter
mg/L - milligrams per liter
SU - standard units

Prepared by: KRM 10/10/2014
Checked by: CTM 10/10/2014

FIGURES



Legend

- Groundwater Monitoring Location
- Groundwater and Surface Water Monitoring Location
- Surface Water Location
- Sediment Sample Location
- Destroyed Monitoring Well
- Paved Road
- Unpaved Road
- Site Boundary
- Wetland Boundary
- Railroad
- Structure
- Water
- Culvert
- Trail

AMEC Environment & Infrastructure
107 Audubon Road Suite 301
Wakefield, MA 01880

N

0 90 180 360 Feet

Figure 1
Slurry Wall / Cap Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 07/31/13 | Checked/Date: CTM 07/31/13

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_IRWP2.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\Figures\Figure 1 - Slurry Wall Cap Monitoring Program Sampling Locations.pdf 7/31/2013 11:51 AM brian.roden

Legend

- CapSeams
- Monitoring Well

P-# = Perforations
SB-# = Sandbag Not Tied
T-# = Tear
W-# = Ponding Water
WB-# = Water Between Cap Layers

Note:
Figure based on changes since last inspection.

AMEC Environment & Infrastructure
271 Mill Road
Chelmsford, MA 01824

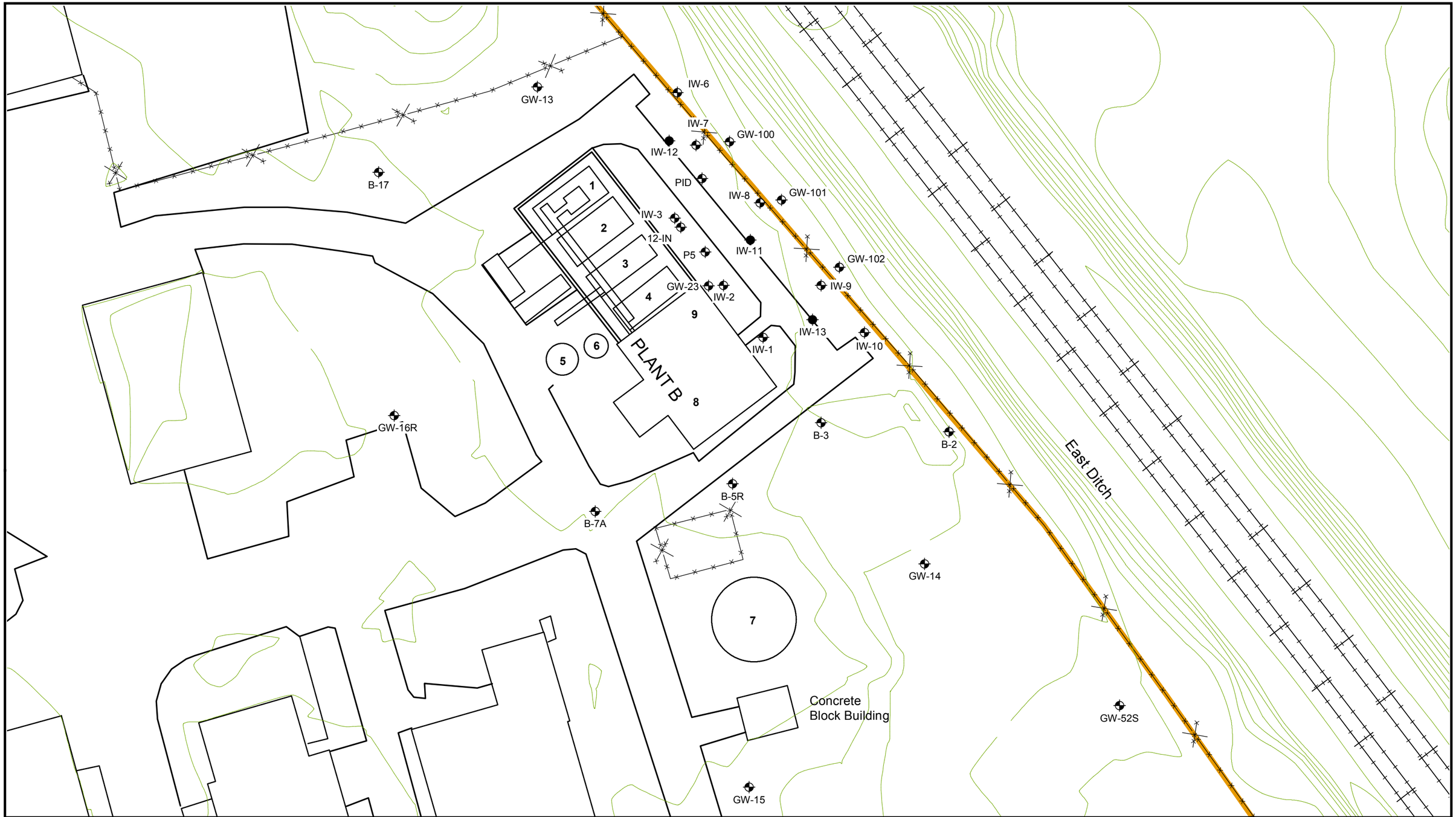
N

0 30 60 120 Feet

Figure 2
Third Quarter 2014 Temporary Cap Inspection Observations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared by BJR | Checked by CTM



Tank #1 - Receives gravity overflow from Tank 2 and allows for further settling
Tank #2 - Caustic addition and initial iron drop-out
Tank #3 & #4 - Overnight holding tank for treated water
Tank #5 - Pre-carbon hold tank
Tank #6 - Residence tank
Tank #7 - Raw water (pH adjusted)
Tank #8 - Pre-carbon transfer
Tank #9 - Day discharge to NPDES Outfall 002

Legend

- Monitoring Well
- Recovery Well
- Elevation Contours

AMEC Environment & Infrastructure
107 Audubon Road Suite 301
Wakefield, MA 01880

N

0 15 30 60 Feet

Figure 3
Plant B Monitoring Program
Sampling Locations

Interim Response Steps Field Activity Report
Olin Chemical Superfund Site
Wilmington, Massachusetts

Prepared/Date: BJR 6/12/12 | Checked/Date: CTM 6/12/12

Document: P:\old_Wakefield_Data\projects\OLIN\Wilmington\GIS\MapDocuments\Interim Response Work Plan\Olin_PlantB_11X17_LS.mxd PDF: P:\old_Wakefield_Data\projects\OLIN\Wilmington\2011 Quarterly Sampling\November 2011\Report\Figures\Figure 3 - Plant B Monitoring Program Sampling Locations.pdf 6/19/2012

APPENDIX A

Field Data Records and Field Instrument Calibration Records

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 8/19/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: [signature] for Olin
CHECKED BY: CTM DATE: 10/23/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM CALIBRATION Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM CALIBRATION CHECK Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	4.00	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	3.99	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		337	+/- 10 mV		335	+/- 10 mV
Conductivity	mS/cm	4.49	4.48	+/- 3% of standard	4.49	4.14	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	8.65	+/- 0.2 mg/L	--	11.34	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		21.46			13.44	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.1	10	10.0	+/- 5% of standard
Standard	NTU	20	20.1	20	19.9	
Standard	NTU	100	98.3	100	98.5	
Standard	NTU	800	776	800	773	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto-Cal Solution
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 8/20/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE:
CHECKED BY: CTM DATE: 10/23/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time: / End Time:)	AM CALIBRATION Meter Value	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time: / End Time:)	PM CALIBRATION CHECK Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.97	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	4.00	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		342	+/- 10 mV		197	+/- 10 mV
Conductivity	mS/cm	4.49	4.48	+/- 3% of standard	4.49	4.51	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L [1 (see Chart 1)]	--	8.03	+/- 0.2 mg/L	--	14.13	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		22.9			13.13	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.2	10	10.5	+/- 5% of standard
Standard	NTU	20	19.9	20	21.9	
Standard	NTU	100	97.9	100	103	
Standard	NTU	800	769	800	767	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto-Cal Solution
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 8/21/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: for Olin
CHECKED BY: CTM DATE: 10/23/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

	Units	AM CALIBRATION Standard Value (Start Time:)	AM CALIBRATION Meter Value (End Time:)	*Acceptance Criteria (AM)	PM CALIBRATION CHECK Standard Value (Start Time:)	PM CALIBRATION CHECK Meter Value (End Time:)	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.97	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	3.93	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		298	+/- 10 mV		226	+/- 10 mV
Conductivity	mS/cm	4.49	4.48	+/- 3% of standard	4.49	4.30	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L[1] (see Chart 1)	--	8.17	+/- 0.2 mg/L	--	7.86	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		21.83			22.26	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.0	10	10.1	+/- 5% of standard
Standard	NTU	20	19.8	20	19.9	
Standard	NTU	100	98.3	100	99.2	
Standard	NTU	800	780	800	771	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto-Cal Solution
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

amec

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Olin Chemical Superfund Site
PROJECT NUMBER: 6107140016
PROJECT LOCATION: 51 Eames St, Wilmington, MA
WEATHER CONDITIONS (AM):
WEATHER CONDITIONS (PM):

TASK NO: DATE: 8/26/2014
AMEC CREW: Olin - BEG
SAMPLER NAME: Brian Guichard
SAMPLER SIGNATURE: Chris for Olin
CHECKED BY: CTM DATE: 10/23/2014

MULTI-PARAMETER WATER QUALITY METER

METER TYPE: Horiba
MODEL NO.: U-52
UNIT ID NO.: Olin

AM CALIBRATION — Start Time: End Time:

PM CALIBRATION CHECK — Start Time: End Time:

	Units	Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
pH (4)	SU	4.0	3.99	+/- 0.1 pH Units			
pH (7)	SU	7.0	--	+/- 0.1 pH Units	4.0	4.02	+/- 0.3 pH Units
pH (10)	SU	10.0	--	+/- 0.1 pH Units			
Redox	+/- mV		312	+/- 10 mV		278	+/- 10 mV
Conductivity	mS/cm	4.49	4.49	+/- 3% of standard	4.49	4.55	+/- 5% of standard
DO (saturated)	%		--	+/- 2% of standard			
DO (saturated)	mg/L [1] (see Chart 1)	--	8.86	+/- 0.2 mg/L	--	7.20	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	--	< 0.5 mg/L			
Temperature	°C		23.28			28.21	
Baro. Press.	mmHg		--			--	

TURBIDITY METER

METER TYPE: Hach
MODEL NO.: 2100Q
UNIT ID NO.: Olin

	Units	Standard Value	Meter Value	Standard Value	Meter Value	*Acceptance Criteria (PM)
Standard	NTU	10	10.1	10	10.1	+/- 5% of standard
Standard	NTU	20	19.9	20	20.4	
Standard	NTU	100	98.2	100	97.6	
Standard	NTU	800	775	800	778	

PHOTOIONIZATION DETECTOR

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Background	ppmv	<0.1		<0.1		within 5 ppmv of BG
Span Gas	ppmv	100		100		+/- 10% of standard

O_2-LEL 4 GAS METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

Methane	%	50		50	+/- 10% of standard
O_2	%	20.9		20.9	+/- 10% of standard
H_2S	ppmv	25		25	+/- 10% of standard
CO	ppmv	50		50	+/- 10% of standard

OTHER METER

METER TYPE:
MODEL NO.:
UNIT ID NO.:

See Notes Below for Additional Information

[X] Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above (see notes).
[ ] Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source:
Lot#/Date Produced:
Trip Blank Source: Lab
Sample Preservatives Source: Lab
Disposable Filter Type: Pine 0.45µm
Calibration Fluids / Standard Source:
- DO Calibration Fluid (<0.1 mg/L): Pine Auto-Cal Solution
- Other
- Other
- Other

	Cal. Standard Lot Number	Exp. Date
pH (4)	Pine Auto-Cal Solution	Pine Auto-Cal Solution
pH (7)	--	--
pH (10)	--	--
ORP	--	--
Conductivity	--	--
10 Turb. Stan.	Pine cal set	Pine cal set
20 Turb. Stan.	"	"
100 Turb. Stan.	"	"
800 Turb. Stan.	"	"
PID Span Gas		
O_2-LEL Span Gas		
DO		

NOTES:

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* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-25	ROUND NO.	3
SAMPLE ID	OC-GW-25	SITE TYPE	Superfund	DATE	8/21/2014
TIME	START 9:10 END 9:50	JOB NUMBER	6107140016	BOTTLE TIME	9:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 5.27 FT.

WELL DEPTH (TOR): 11.81 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 5.49 FT.

SCREEN LENGTH: 3 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.02 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.44 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:15	5.49	185	19.52	0.825	6.42	2.80	2.28	-77	~ 10 ft.	
9:20	5.49	185	18.97	0.818	6.67	1.87	1.54	-131		
9:25	5.49	185	18.11	0.797	7.02	0.87	0.79	-179		
9:30	5.49	185	17.48	0.793	7.12	0.21	0.61	-178		
9:35	5.49	185	17.22	0.794	7.09	0.02	0.59	-168		
9:40	5.49	185	17.22	0.794	7.09	> 0.01	1.05	-168		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-78S	ROUND NO.	3
SAMPLE ID	OC-GW-78S	SITE TYPE	Superfund	DATE	8/19/2014
TIME	START 8:45 END 9:25	JOB NUMBER	6107140016	BOTTLE TIME	9:15

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.63 FT.

WELL DEPTH (TOR): 10.33 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.86 FT.

SCREEN LENGTH: 9 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.04 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.02

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.64 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:50	4.86	210	19.14	1.15	6.32	7.25	15.5	20	~ 8 ft.	
8:55	4.86	210	18.24	1.15	6.47	6.51	7.11	-5		
9:00	4.86	210	17.61	1.16	6.50	6.02	4.08	-5		
9:05	4.86	210	17.41	1.16	6.51	5.86	3.12	-6		
9:10	4.86	210	17.20	1.17	6.51	5.52	0.89	-7		
9:15	4.86	210	17.14	1.17	6.51	5.40	1.85	-8		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.6 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-79S	ROUND NO.	3
SAMPLE ID	OC-GW-79S	SITE TYPE	Superfund	DATE	8/20/2014
TIME START	11:00 END 11:35	JOB NUMBER	6107140016	BOTTLE TIME	11:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 4.31 FT.

WELL DEPTH (TOR): 11.27 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 4.39 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.20 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:05	4.39	180	15.86	1.35	6.09	1.19	48.7	16	~ 8 ft.	
11:10	4.39	180	15.69	1.36	6.05	0.49	4.21	10		
11:15	4.39	180	15.64	1.38	6.04	0.26	2.37	4		
11:20	4.39	180	15.62	1.38	6.04	0.07	3.98	-1		
11:25	4.39	180	15.69	1.38	6.03	>0.01	2.87	-4		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[x] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[x] Ammonia-Nitrogen
[x] Chloride	300.0	4 DEG. C	1 X 125 mL	[x] Chloride
[x] Sulfate	300.0	4 DEG. C	1 X 125 mL	[x] Sulfate
[x] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[x] Specific Conductivity
[x] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[x] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.2 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202S	ROUND NO.	3
SAMPLE ID	OC-GW-202S	SITE TYPE	Superfund	DATE	8/19/2014
TIME	START 10:55 END 11:30	JOB NUMBER	6107140016	BOTTLE TIME	11:20

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 6.61 FT.

WELL DEPTH (TOR): ~ 13.2 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 6.62 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.50 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
11:00	6.62	230	17.41	0.730	6.49	2.20	8.55	44	~ 10 ft.	
11:05	6.62	230	16.82	0.712	6.26	0.42	7.80	74		
11:10	6.62	230	16.21	0.708	6.17	>0.01	4.36	96		
11:15	6.62	230	16.16	0.709	6.16	>0.01	2.20	99		
11:20	6.62	230	16.18	0.709	6.15	>0.01	1.23	101		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.5 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-202D	ROUND NO.	3
SAMPLE ID	OC-GW-202D	SITE TYPE	Superfund	DATE	8/20/2014
TIME	START 8:40 END 9:20	JOB NUMBER	6107140016	BOTTLE TIME	9:10

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

INITIAL DEPTH TO WATER: 6.02 FT.

FINAL DEPTH TO WATER: 6.11 FT.

DRAWDOWN VOLUME: 0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

TOTAL VOL. PURGED: 1.40 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

WELL DEPTH (TOR): 23.68 FT.

SCREEN LENGTH: 10 FT.

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: <0.01

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PID AMBIENT AIR: N/A PPM

PID WELL MOUTH: N/A PPM

PRESSURE TO PUMP: N/A PSI

REFILL TIMER SETTING: N/A SEC.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

WELL DIAMETER: 2 IN.

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:45	6.11	130	20.50	3.47	4.43	1.89	19.4	259	~ 20 ft.	
8:50	6.11	130	19.93	3.49	4.45	0.52	13.2	256		
8:55	6.11	130	19.25	3.50	4.47	0.39	9.70	254		
9:00	6.11	130	18.72	3.50	4.51	0.01	8.21	250		
9:05	6.11	130	18.03	3.46	4.54	0.26	7.99	245		
9:10	6.11	130	17.89	3.48	4.54	0.19	7.94	245		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.4 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-16RR	ROUND NO.	3
SAMPLE ID	OC-PZ-16RR	SITE TYPE	Superfund	DATE	8/20/2014
TIME	START 10:45 END 11:00	JOB NUMBER	6107140016	BOTTLE TIME	10:50

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 3.70 FT.

WELL DEPTH (TOR): 5.24 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.06 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:50	3.70	--	20.10	1.04	7.02	2.14	892	-113	~ 5 ft.	Piezometer
	Well dry									
10:50	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.06 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-17RRR	ROUND NO.	3
SAMPLE ID	OC-PZ-17RRR	SITE TYPE	Superfund	DATE	8/21/2014
TIME	START 10:05 END 10:45	JOB NUMBER	6107140016	BOTTLE TIME	10:10

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): --- FT.

PROTECTIVE CASING / WELL DIFFERENCE: N/A FT.

INITIAL DEPTH TO WATER: 2.49 FT.

WELL DEPTH (TOR): 6.86 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 0.75 IN.

FINAL DEPTH TO WATER: Dry FT.

SCREEN LENGTH: 1 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: N/A GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: N/A

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.2 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:10	2.49	--	17.94	0.488	6.99	4.75	238	-91	~ 6 ft.	Piezometer
	Well dry									
10:10	Sample recharge									

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [ ] HIGH DENSITY POLYETHYLENE
- [X] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 125 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 125 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 125 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 250 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.2 gal.

LOCATION SKETCH

NOTES

SIGNATURE: Chris Mahan for Olin

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-18R	ROUND NO.	3
SAMPLE ID	OC-PZ-18R	SITE TYPE	Superfund	DATE	8/20/2014
TIME	START 9:45 END 10:40	JOB NUMBER	6107140016	BOTTLE TIME	10:25

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [ ] TOP OF WELL RISER
- [X] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 1.99 FT.

WELL DEPTH (TOR): 3.82 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1 IN.

FINAL DEPTH TO WATER: 2.57 FT.

SCREEN LENGTH: 1.6 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.02 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.02

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 1.04 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:50	2.57	100	18.33	2.23	6.65	5.37	36.7	-75	~ 3.8 ft.	Piezometer
9:55	2.57	100	18.40	2.12	6.75	4.97	29.3	-106		
10:00	2.57	100	18.45	2.03	6.78	4.26	12.0	-123		
10:05	2.57	100	18.56	1.88	6.81	3.66	6.93	-126		
10:10	2.57	100	18.60	1.87	6.81	3.65	4.06	-126		
10:15	2.57	100	18.66	1.82	6.80	3.53	2.80	-125		
10:20	2.57	100	18.67	1.80	6.80	3.40	2.68	-125		
10:25	2.57	100	18.69	1.79	6.80	3.31	1.95	-125		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.0 gal.

NOTES

SIGNATURE: Ch [illegible] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-24	ROUND NO.	3
SAMPLE ID	OC-PZ-24	SITE TYPE	Superfund	DATE	8/19/2014
TIME	START 10:10 END 10:50	JOB NUMBER	6107140016	BOTTLE TIME	10:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.80 FT.

WELL DEPTH (TOR): 17.6 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.86 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.86 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
10:15	8.86	110	17.65	1.97	6.40	1.45	29.2	-72	~ 14 ft.	
10:20	8.86	110	17.67	1.94	6.30	0.70	16.6	-73		
10:25	8.86	110	17.64	1.88	6.34	0.32	14.9	-75		
10:30	8.86	110	17.66	1.85	6.36	0.07	4.98	-76		
10:35	8.86	110	17.73	1.84	6.40	>0.01	4.93	-76		
10:40	8.86	110	17.75	1.82	6.41	>0.01	4.09	-77		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.8 gal.

NOTES

SIGNATURE: for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	PZ-25	ROUND NO.	3
SAMPLE ID	OC-PZ-25	SITE TYPE	Superfund	DATE	8/19/2014
TIME	START 9:35 END 10:05	JOB NUMBER	6107140016	BOTTLE TIME	10:00

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT
- [X] TOP OF WELL RISER
- [ ] TOP OF PROTECTIVE CASING
- [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 8.41 FT.

WELL DEPTH (TOR): 17.7 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 1.5 IN.

FINAL DEPTH TO WATER: 8.45 FT.

SCREEN LENGTH: 10 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: <0.01 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.01

PRESSURE TO PUMP: N/A PSI

TOTAL VOL. PURGED: 0.91 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
9:40	8.45	140	17.36	1.20	6.54	1.93	6.05	-22	~ 14 ft.	
9:45	8.45	140	17.26	1.18	6.34	0.21	3.10	-20		
9:50	8.45	140	17.21	1.17	6.32	>0.01	1.86	-18		
9:55	8.45	140	17.12	1.16	6.32	>0.01	0.99	-16		
10:00	8.45	140	17.10	1.16	6.31	>0.01	1.77	-16		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[ ] VOCs
[ ] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[ ] SVOCs
[ ] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[ ] VPH
[ ] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Fe
[ ] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[ ] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[X] Chloride	300.0	4 DEG. C	1 X 500 mL	[X] Chloride
[X] Sulfate	300.0	4 DEG. C	1 X 500 mL	[X] Sulfate
[X] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[X] Specific Conductivity
[X] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 0.90 gal.

LOCATION SKETCH

NOTES

SIGNATURE: for Olin

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - LOW FLOW GROUNDWATER SAMPLING

PROJECT	OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA	WELL ID	GW-16R	ROUND NO.	3
SAMPLE ID	OC-GW-16R	SITE TYPE	Superfund	DATE	8/26/2014
TIME	START 7:55 END 9:15	JOB NUMBER	6107140016	BOTTLE TIME	8:40

WATER LEVEL / PUMP SETTINGS

QC SAMPLE COLLECTED ID: N/A

MEASUREMENT POINT: [X] TOP OF WELL RISER [ ] TOP OF PROTECTIVE CASING [ ] OTHER _____

PROTECTIVE CASING STICKUP (FROM GROUND): See survey FT.

PROTECTIVE CASING / WELL DIFFERENCE: -- FT.

INITIAL DEPTH TO WATER: 11.92 FT.

WELL DEPTH (TOR): 17.17 FT.

PID AMBIENT AIR: N/A PPM

WELL DIAMETER: 2 IN.

FINAL DEPTH TO WATER: 12.29 FT.

SCREEN LENGTH: 5 FT.

PID WELL MOUTH: N/A PPM

WELL INTEGRITY:

	YES	NO	N/A
CAP			
CASING			
LOCKED			
COLLAR			

DRAWDOWN VOLUME: 0.06 GAL.
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))

RATIO OF DRAWDOWN VOLUME TO TOTAL VOLUME PURGED: 0.05

PRESSURE TO PUMP: N/A PSI

TOTAL VOL PURGED: 1.30 GAL.
(purge rate (milliliters per minute) x time duration (minutes) x 0.00026 gal/ml)

REFILL TIMER SETTING: N/A SEC.

DISCHARGE TIMER SETTING: N/A SEC.

PURGE DATA

TIME	DEPTH TO WATER (ft.) (0.3 ft.)	PURGE RATE (ml/min) (100-400)	TEMP. (deg. C) (3%)	SPEC. COND. (mS/cm) (3%)	pH (units) (+/- 0.1 unit)	DISS. O2 (mg/L) (10%)(>0.5)	TURBIDITY (NTU) (10%) (> 5)	ORP/Eh (mV) (+/- 10 mV)	SAMPLE DEPTH (ft.)	COMMENTS
8:05	12.26	100	21.32	0.340	5.83	1.63	4.76	114	~ 15 ft.	
8:10	12.29	110	20.40	0.256	6.14	0.91	2.49	29		
8:15	12.29	110	19.65	0.231	6.25	1.01	1.57	1		
8:20	12.29	110	19.40	0.215	6.25	0.68	1.62	-6		
8:25	12.29	110	19.45	0.210	6.27	0.85	1.66	-11		
8:30	12.29	110	19.53	0.209	6.27	2.06	2.67	-11		
8:35	12.29	110	19.48	0.208	6.29	2.02	2.59	-11		
8:40	12.29	110	19.57	0.208	6.27	1.98	2.76	-10		

EQUIPMENT DOCUMENTATION

TYPE OF PUMP
- [ ] QED BLADDER
- [ ] SIMCO BLADDER
- [X] GEOPUMP

TYPE OF TUBING
- [ ] TEFLON OR TEFLON LINED
- [X] HIGH DENSITY POLYETHYLENE
- [ ] LDPE (Dedicated)

TYPE OF PUMP MATERIAL
- [ ] POLYVINYL CHLORIDE
- [ ] STAINLESS STEEL
- [X] SILICON (Dedicated)

TYPE OF BLADDER MATERIAL
- [ ] TEFLON
- [ ] OTHER _____

ANALYTICAL PARAMETERS

To Be Collected	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X] VOCs: Trimethylpentenes	8260 B	HCL / 4 DEG. C	3 X 40 mL	[X] VOCs
[X] SVOCs: NDPA and BEHP	8270 C	4 DEG. C	2 X 1 L AG	[X] SVOCs
[X] VPH	MA VPH	HCL / 4 DEG. C	3 X 40 mL	[X] VPH
[X] Dissolved Fe	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[X] Dis. Fe
[X] pH	SM 4500 H+B	4 DEG. C	1 X 500 mL	[X] pH
[X] Ammonia-Nitrogen	10-107-06-1	H2SO4 / 4 DEG. C	1 X 250 mL	[X] Ammonia-Nitrogen
[ ] Chloride	300.0	4 DEG. C	1 X 500 mL	[ ] Chloride
[ ] Sulfate	300.0	4 DEG. C	1 X 500 mL	[ ] Sulfate
[ ] Specific Conductivity	SM 2510B	4 DEG. C	1 X 500 mL	[ ] Specific Conductivity
[ ] Dissolved Al, Cr	DIS. 6010B	HNO3 / 4 DEG. C	1 X 500 mL	[ ] Dis. Al, Cr

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: [YES] NO

NUMBER OF GALLONS GENERATED: ~ 1.3 gal.

NOTES

SIGNATURE: [signature] for Olin

LOCATION SKETCH

Sampled by: BEG

Prepared by: KRM

Checked by: CTM

amec

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-ISCO1 | ACTIVITY TIME: START 11:40 END 11:55 | BOTTLE TIME: 11:45

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.2 ft.	SPEC. COND	0.884 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.60 ft.	D.O.	2.68 mg/L
TEMPERATURE	19.45 DEG C	SALINITY	--- %
TURBIDITY	3.11 NTU	ORP	88 mV
pH	6.11 UNITS		

EQUIPMENT USED:
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER:
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT:
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION:
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-ISCO2 | ACTIVITY TIME: START 10:10 END 10:20 | BOTTLE TIME: 10:15

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.20 ft.	SPEC. COND	0.752 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.10 ft.	D.O.	3.51 mg/L
TEMPERATURE	21.7 DEG C	SALINITY	--- %
TURBIDITY	4.52 NTU	ORP	-18 mV
pH	6.46 UNITS		

EQUIPMENT USED:
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER:
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT:
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION:
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

No flow noted.

Sample collected from stagnant water.

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-ISCO3 | ACTIVITY TIME: START 9:55 END 10:10 | BOTTLE TIME: 10:00

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.40 ft.	SPEC. COND	0.775 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.20 ft.	D.O.	8.43 mg/L
TEMPERATURE	22.82 DEG C	SALINITY	--- %
TURBIDITY	5.46 NTU	ORP	73 mV
pH	6.66 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [X] NONE

SEDIMENT DATA

SEDIMENT SAMPLE — START DEPTH [ ] | END DEPTH [ ]

TYPE OF SAMPLE — GRAB [ ]

SAMPLE OBSERVATIONS

ODOR _____

COLOR _____

FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: Chris for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA
JOB NUMBER: 6107140016
DATE: 8/26/2014
FIELD SAMPLE ID: OC-SW-PZ16RR
ACTIVITY TIME: START 10:35 END 10:45
BOTTLE TIME: 10:40
QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION: 0.33 ft.
SPEC. COND: 2.30 mS/cm
DEPTH OF SAMPLE FROM SURFACE: 0.15 ft.
D.O.: 4.78 mg/L
TEMPERATURE: 28.18 DEG C
SALINITY: --- %
TURBIDITY: 10.9 NTU
ORP: 15 mV
pH: 6.39 UNITS

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER _____

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE START DEPTH [ ]
END DEPTH [ ]
TYPE OF SAMPLE GRAB [ ]
SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS

	SURFACE WATER	METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS

	SEDIMENT	METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: [signature] for Olin

amec

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC. PAGE 1 OF 1

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-PZ17RRR | ACTIVITY TIME: START 10:55 END 11:05 | BOTTLE TIME: 11:00

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.70 ft.	SPEC. COND	2.22 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.35 ft.	D.O.	3.90 mg/L
TEMPERATURE	18.37 DEG C	SALINITY	--- %
TURBIDITY	34.3 NTU	ORP	104 mV
pH	5.77 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [X] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [ ] OTHER

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ] | TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[X]	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	[X]
[X]	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Chloride	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	[X]
[X]	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	[X]
[X]	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[X]	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	[X]
[ ]						[ ]
[ ]						[ ]

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
[ ]	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	[ ]
[ ]	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]
[ ]					[ ]

NOTES

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-PZ18R | ACTIVITY TIME: START 11:20 END 11:35 | BOTTLE TIME: 11:25

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	1.0 ft.	SPEC. COND	0.851 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.5 ft.	D.O.	4.17 mg/L
TEMPERATURE	19.37 DEG C	SALINITY	--- %
TURBIDITY	5.01 NTU	ORP	77 mV
pH	6.22 UNITS		

EQUIPMENT USED
- [ ] BEAKER
- [ ] PACS BOMB
- [X] PERISTALTIC PUMP
- [X] FILTER (0.45 micron)
- [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER
- [ ] STREAM/ DITCH
- [ ] LAKE/ POND
- [ ] SEEP
- [ ] MARSH
- [X] OTHER: Weir Area

DECON FLUIDS USED:
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ] | END DEPTH [ ] | TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS
ODOR _____
COLOR _____
FLOC OBSERVED _____ CLEAR OF LEAF LITTER _____

TYPE OF SEDIMENT
- [ ] ORGANIC
- [ ] SAND
- [ ] GRAVEL
- [ ] CLAY
- [ ] OTHER _____

EQUIPMENT FOR COLLECTION
- [ ] HAND AUGER
- [ ] S.S. SPOON
- [ ] ALUMINIUM PAN
- [ ] DREDGE
- [ ] OTHER _____

DECON FLUIDS USED
- [ ] DI WATER
- [ ] POTABLE WATER
- [ ] LIQUINOX
- [ ] OTHER _____

ANALYTICAL PARAMETERS
SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

ANALYTICAL PARAMETERS
SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

FIELD DATA RECORD - SURFACE WATER

PROJECT: OLIN CHEMICAL SUPERFUND SITE, WILMINGTON, MA | JOB NUMBER: 6107140016 | DATE: 8/26/2014

FIELD SAMPLE ID: OC-SW-SD17 | ACTIVITY TIME: START 11:05 END 11:15 | BOTTLE TIME: 11:10

QC SAMPLES COLLECTED: N/A

SURFACE WATER DATA

WATER DEPTH AT LOCATION	0.70 ft.	SPEC. COND	1.94 mS/cm
DEPTH OF SAMPLE FROM SURFACE	0.35 ft.	D.O.	3.05 mg/L
TEMPERATURE	18.13 DEG C	SALINITY	--- %
TURBIDITY	13.4 NTU	ORP	109 mV
pH	5.36 UNITS		

EQUIPMENT USED: [ ] BEAKER; [ ] PACS BOMB; [X] PERISTALTIC PUMP; [X] FILTER (0.45 micron); [X] LDPE Tubing & Silicon

TYPE OF SURFACE WATER: [X] STREAM/ DITCH; [ ] LAKE/ POND; [ ] SEEP; [ ] MARSH; [ ] OTHER

DECON FLUIDS USED: [ ] DI WATER; [ ] POTABLE WATER; [ ] NONE

SEDIMENT DATA

SEDIMENT SAMPLE: START DEPTH [ ]; END DEPTH [ ]; TYPE OF SAMPLE: GRAB [ ]

SAMPLE OBSERVATIONS: ODOR _____; COLOR _____; FLOC OBSERVED _____

TYPE OF SEDIMENT: [ ] ORGANIC; [ ] SAND; [ ] GRAVEL; [ ] CLAY; [ ] OTHER _____

EQUIPMENT FOR COLLECTION: [ ] HAND AUGER; [ ] S.S. SPOON; [ ] ALUMINIUM PAN; [ ] DREDGE; [ ] OTHER _____

DECON FLUIDS USED: [ ] DI WATER; [ ] POTABLE WATER; [ ] LIQUINOX; [ ] OTHER _____

CLEAR OF LEAF LITTER _____

ANALYTICAL PARAMETERS

SURFACE WATER

		METHOD NUMBER	FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
X	Ammonia-Nitrogen	10-107-06-1	N	H2SO4 / 4 DEG. C	1 X 250 mL	X
X	Nitrate / Nitrite	300.0	N	4 DEG. C	1 X 500 mL	X
X	Chloride	300.0	N	4 DEG. C	1 X 500 mL	X
X	Sulfate	300.0	N	4 DEG. C	1 X 500 mL	X
X	Specific Conductivity	SM 2510B	N	4 DEG. C	1 X 500 mL	X
X	Total Al, Cr, Na	Total 6010B	N	HNO3 / 4 DEG. C	1 X 500 mL	X
X	Dissolved Al, Cr, Na	DIS. 6010B	Y	HNO3 / 4 DEG. C	1 X 500 mL	X

SEDIMENT

		METHOD NUMBER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED
	% Solids / Moisture	160.3	4 DEG. C	1 X 8 oz.	
	Total Al, Cr, Fe	Total 6010B	4 DEG. C	1 X 8 oz.	

NOTES

SIGNATURE: _____ for Olin

Sampled by: BEG
Prepared by: KRM
Checked by: CTM

APPENDIX B

Chains of Custody

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes☐ No☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Olin Corp	James Cashwell	8-26-14	279939
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 **of** 1
51 Eames St	423 336 4500		

City	State	Zip Code	Site Contact	Lab Contact
Wilmington	MA	01887	Brian Guchard	Becky Mason

Project Name and Location (State): Olin Quarterly

Carrier/Waybill Number:

Contract/Purchase Order/Quote No.: James Cashwell

Analysis (Attach list if more space is needed): 300.0 chloride; 350.1 ammonia; 6010 MCP AVCR; 2510B spec. cond.

Special Instructions/ Conditions of Receipt

480-66192 Chain of Custody

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	300.0 chloride	350.1 ammonia	6010 MCP AVCR	2510B spec. cond.
OC PZ16RR	8-20-14	10:50		✓			2	1	1				✓	✓	✓	✓
OC PZ17RRR	8-21-14	10:10		✓			2	1	1				✓	✓	✓	✓
OC PZ18R	8-20-14	10:25		✓			2	1	1				✓	✓	✓	✓
OC PZ24	8-19-14	10:40		✓			2	1	1				✓	✓	✓	✓
OC PZ25	8-19-14	10:00		✓			2	1	1				✓	✓	✓	✓
OC GW25	8-21-14	9:40		✓			2	1	1				✓	✓	✓	✓
OC GW78S	8-19-14	9:15		✓			2	1	1				✓	✓	✓	✓
OC GW79S	8-20-14	11:25		✓			2	1	1				✓	✓	✓	✓
OC GW202S	8-19-14	11:20		✓			2	1	1				✓	✓	✓	✓
OC GW202D	8-20-14	9:10		✓			2	1	1				✓	✓	✓	✓

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By	8-26-14		1. Received By	8-26-14	1400
2. Relinquished By	8-26-14	1630	2. Received By TLL	8-27-14	0170
3. Relinquished By			3. Received By		

Comments: 2.4, 2.7 #1

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-66175 Chain of Custody

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	COC No: 480-53132-12290.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@t	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days):		
State, Zip: MA, 01887			
Phone: 423-336-4012(Tel)	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Plant B Quarterly Event Desc: Plant B quarterly(March/May/Augu	Project #: 48006612		
Site: Massachusetts	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - MA VPH	8260MCP - TMP 8260	8270_LL_MCP - NDPA/BEHP 8270LL	SM4500_H+ - pH								Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	A	N	N									
OC-GW-16R	8-26-14	8:40	G	Water			✓	✓	✓	✓	✓	✓								11	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:	
Relinquished by:	Date/Time: 8-26-14	Company	Received by:	Date/Time: 8-26-14 1900	Company TAL
Relinquished by:	Date/Time: 8-26-14 1630	Company	Received by:	Date/Time: 8-27-14 0110	Company TAL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.1 #1

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes☐ No☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Olin Corp	James Cashwell	8-26-14	279922
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
51 Eames St	4233364500		
City	**State / Zip Code**	**Site Contact**	**Lab Contact**
Wilmington	MA 01887	Brian Cuchard	Beeky Mason
Project Name and Location (State)	**Carrier/Waybill Number**		
Olin Quarterly			
Contract/Purchase Order/Quote No.			
James Cashwell			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH
OCISCO 3	8-26-14	10600		✓			3	1	2			
OC ISCO 2	8-26-14	10115		✓			3	1	2			
OC PZ16RRSW	8-26-14	10140		✓			3	1	2			
OC PZ17RRSW	8-26-14	11:00		✓			3	1	2			
OC SD17 SW	8-26-14	11:10		✓			3	1	2			
OC PZ18RSW	8-26-14	11:25		✓			3	1	2			
OC ISCO 1	8-26-14	11:45		✓			3	1	2			

Analysis (Attach list if more space is needed): 300.0/chloride; 350.1/Ammonia; 6010 Metals; 6010 *Filter; 2540B, 353.2

Special Instructions/ Conditions of Receipt

480-66191 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	8-26-14		1. Received By	8-26-14	1700
2. Relinquished By	8-26-14	1630	2. Received By TK	8-27-14	0130
3. Relinquished By			3. Received By		

Comments

2-1, 2-7 ttl

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

APPENDIX C

Third Quarter 2014
Temporary Cap Inspection Photo Log

Photo 1: General Cap Photo Looking North

Photo 2: Typical Small Perforations (needs repair)

Photo 3: Cuts (tears) on Cap (needs repair)

Photo 4: Large Tear on Cap (needs repair)

Photo 5: Typical Perforation (needs repair)

Photo 6: Water Noted Between the Caps

APPENDIX B

Data Validation Memorandum (*Provided on CD*)

B-1 Second Quarter 2014 Sampling Event
B-2 Third Quarter 2014 Sampling Event
B-3 Additional Sampling Events
May 2014 Private Well Sampling
May 2014 Calcium Sulfate Landfill Sampling
September 2014 Private Well Sampling
B-4 Unvalidated Data
April 2014 – September 2014 Plant B RGP and Frac Tank Sampling

June 29, 2015

To: James Cashwell
From: Chris Ricardi
Subject: 51 Eames Street Property Slurry Wall Quarterly Monitoring Program 4Q14 – November 2014

DATA VALIDATION REPORT
NOVEMBER 2014 SLURRY WALL GROUNDWATER AND SURFACE WATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

Testamerica Laboratories Data Sets: 480-70790, 480-70792, 480-70932, 480-71175, And 480-71471

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site on November 3 to November 14, 2014. Samples were analyzed by TestAmerica Laboratories Inc. in Buffalo, New York. Data were reported in sample delivery groups (SDGs) 480-70790-1, 480-70792-1, 480-70932-1, 480-71175-1 and 480-71471-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for one or more of the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- Dissolved Metals (aluminum and chromium) by USEPA Method 6010C in groundwater
- Dissolved and Total Metals (aluminum, chromium, and sodium) by USEPA Method 6010C in surface water
- General chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1B), chloride and sulfate by USEPA Method 300.0, nitrate and nitrite by Method 353.2, and specific conductance by SM A2510B

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of data validation actions and associated qualifier reason codes is presented in Table 3.

2.0 METALS

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample / Laboratory Control Sample Duplicate Analysis (LCS/LCSD)

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

* Matrix Spike / Matrix Spike Duplicate Analysis (MS/MSD) [groundwater only]
  Detection Limits
* Dissolved vs. Total Metals Comparison (surface water only)

* indicates that criteria were met for this parameter

Detection Limits

The reporting limit for aluminum (200 µg/L) is greater than the reporting limit of 100 µg/L specified in the Final Interim Response Steps Work Plan (IRSWP). Positively detected results are reported to the method detection limit (MDL) of 60 µg/L.

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

* Data Completeness
  Holding Time
* Blanks
* Laboratory Duplicate Analysis (specific conductance, ammonia, and nitrite)
* LCS/LCSD
  Field Duplicate
  MS/MSD
  Detection Limits

* indicates that criteria were met for this parameter

Holding Time

SDG 480-70792-1

The laboratory reported that due to an ammonia matrix spike/matrix spike duplicate RPD failure, one sample (OC GW 34D) was reanalysed 29 days from sample collection, which is outside the 28-day hold time window. The lab reported results from both analyses (11 mg/L and 13 mg/L). Based on professional judgment the original sample results were reported in the final data. The ammonia result for this sample was qualified as estimated (11 J mg/L) as discussed in the MS/MSD review below.

Field Duplicates

Three sets of field duplicate samples were collected during this sampling event. A summary of field duplicate results is presented on Table 4. Good agreement was observed for all methods except ammonia. For ammonia, all three field duplicate results exceeded the precision relative percent difference goal of 30. Relatively large differences were observed for sample collected at locations OC GW 34D and OC-GW-202D. Sample results were qualified as estimated values (J). The unusual differences in the field duplicate results indicate that there is uncertainty regarding the association of results to the sample IDs in the lab results. A similar situation is apparent when evaluating the MS/ MSD results.

Matrix Spike

SDG 480-70792-1

Sample OC GW 34D was submitted for MS/MSD analysis. The MS percent recovery for ammonia (138) was above limits, the MSD percent recovery for ammonia (70%) was below

limits, and the MS/MSD RPD for ammonia (22) was above the QC limit of 20. Concentration results for ammonia in samples OC GW 34D and its field duplicate OC GW DUP 1 were qualified estimated (J) and assigned validation reason codes of MS-H, MS-L and MS-RPD.

SDG 480-70932-1

Sample OC-ISCO3 was submitted for MS/MSD analysis with a sample concentration of 1.3 B mg/l for ammonia. The MS and MSD percent recoveries for ammonia were reported a 2760 and 2860 percent. These results suggest that there may have been some form of sample identification error in the field or lab. The laboratory was asked to review their records for possible sample identification or spike errors. No errors were identified in the analytical documentation. The ammonia result for sample OC-ISCO3 was qualified as estimated (J) and assigned a validation reason code of MS-H.

Detection Limits

SDG 480-70792-1

The reporting limits for ammonia (1 and 10 mg/L) were higher than the reporting limit specified in the IRSWP of 0.1 mg/L. All associated results are positive detections.

SDG 480-70932-1

The reporting limit for nitrite (0.02 mg/L) was higher than the reporting limit specified in the IRSWP of 0.01 mg/L.

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.

6/29/15

Chris Ricardi
Senior Chemist

Date

6/29/2015

Michael Murphy
Project Principal

Date

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\6107150016 - Olin Wilmington CSS 2015\3.0 Field and Site Characterization\3.4 Test Results\3.4.1 Data Validation\November 2014 SWC SW GW\DRAFT_Memo_Slurry_Wall_Cap_ Nov2014 val report(NS).docx

Continued…

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Table 1
Sample Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

						Method Class	Sp Cond	Sulfate/Chloride	Ammonia	Nitrate/Nitrite	Dis Metals	Tot Metals
						Analysis Method	A2510B	E300	E350.1	E353.2	SW6010	SW6010
		Field Sample				Fraction	T	T	T	T	D	T
Lab SDG	Location	Date	Field Sample ID	Qc Code	Media							
480-70790-1	GW-202D	11/3/2014	OC-DUP GW 202D	FD	GW		1	2	1		2	
480-70790-1	GW-202D	11/3/2014	OC-GW-202D	FS	GW		1	2	1		2	
480-70790-1	GW-202S	11/3/2014	OC-GW-202S	FS	GW		1	2	1		2	
480-70790-1	GW-25	11/4/2014	OC-GW-25	FS	GW		1	2	1		2	
480-70790-1	GW-78S	11/3/2014	OC-GW-78S	FS	GW		1	2	1		2	
480-70790-1	GW-79S	11/4/2014	OC-GW-79S	FS	GW		1	2	1		2	
480-70790-1	PZ-16RR	11/4/2014	OC-PZ-16RR	FS	GW		1	2	1		2	
480-70790-1	PZ-17RRR	11/4/2014	OC-PZ-17RRR	FS	GW		1	2	1		2	
480-70790-1	PZ-18R	11/4/2014	OC-PZ-18R	FS	GW		1	2	1		2	
480-70792-1	GW-10S	11/4/2014	OC GW 10S	FS	GW		1	2	1		2	
480-70792-1	GW-24	11/4/2014	OC GW 24	FS	GW		1	2	1		2	
480-70792-1	GW-34D	11/3/2014	OC GW 34D	FS	GW		1	2	1		2	
480-70792-1	GW-34D	11/3/2014	OC GW DUP 1	FD	GW		1	2	1		2	
480-70792-1	GW-34SR	11/3/2014	OC GW 34SR	FS	GW		1	2	1		2	
480-70792-1	GW-43SR	11/3/2014	OC GW 43SR	FS	GW		1	2	1		2	
480-70792-1	GW-76S	11/4/2014	OC GW 76S	FS	GW		1	2	1		2	
480-70792-1	MP-2 #13	11/3/2014	OC MP2 PORT 13	FS	GW		1	2	1		2	
480-70932-1	ISCO1	11/6/2014	OC-ISCO1	FS	SW		1	2	1	2	3	3
480-70932-1	ISCO2	11/6/2014	OC-ISCO2	FS	SW		1	2	1	2	3	3
480-70932-1	ISCO3	11/6/2014	OC-ISCO3	FS	SW		1	2	1	2	3	3
480-70932-1	PZ-16RR	11/6/2014	OC-PZ-16RRSW	FS	SW		1	2	1	2	3	3
480-70932-1	PZ-17RRR	11/6/2014	OC-PZ-17RRSW	FS	SW		1	2	1	2	3	3
480-70932-1	PZ-18R	11/6/2014	OC-DUP SW PZ18RSW	FD	SW		1	2	1	2	3	3
480-70932-1	PZ-18R	11/6/2014	OC-PZ-18RSW	FS	SW		1	2	1	2	3	3
480-70932-1	SD-17	11/6/2014	OC-SD-17	FS	SW		1	2	1	2	3	3
480-71175-1	GW-201S	11/11/2014	OC-GW201S	FS	GW		1	2	1		2	
480-71175-1	GW-35S	11/6/2014	OC-GW35S	FS	GW		1	2	1		2	
480-71175-1	GW-CA1	11/6/2014	OC-GWCA1	FS	GW		1	2	1		2	
480-71471-1	PZ-24	11/14/2014	OC-PZ-24	FS	GW		1	2	1		2	
480-71471-1	PZ-25	11/14/2014	OC-PZ-25	FS	GW		1	2	1		2	

Created by: KMS 6/17/15
Checked by: CSR 6/25/15

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

	Lab SDG	480-70790-1		480-70790-1		480-70790-1		480-70790-1		480-70790-1		480-70790-1		480-70790-1	
	Location	GW-202D		GW-202D		GW-202S		GW-25		GW-78S		GW-79S		PZ-16RR		PZ-17RRR	
	Field Sample Date	11/3/2014 11:20		11/3/2014 11:20		11/3/2014 10:35		11/4/2014 10:35		11/3/2014 9:55		11/4/2014 8:45		11/4/2014 9:10		11/4/2014 9:30	
	Field Sample ID	OC-DUP GW 202D		OC-GW-202D		OC-GW-202S		OC-GW-25		OC-GW-78S		OC-GW-79S		OC-PZ-16RR		OC-PZ-17RRR	
	Qc Code	FD		FS		FS		FS		FS		FS		FS		FS	
		GW		GW		GW		GW		GW		GW		GW		GW	
Parameter	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Aluminum	ug/l	2,300		2,200		200	U	200	U	200	U	280		200	U	200	U
Chromium	ug/l	250		240		4.8	J	5.6		3.6	J	23		5		6.5	
Sodium	ug/l																
Aluminum	ug/l																
Chromium	ug/l																
Sodium	ug/l																
Chloride	mg/l	4.2		4.3		4.5		210		25	U	2.8		3.9		0.5	U
Sulfate	mg/l	16		16		5		35	J	480		10		11		8.6	
Ammonia	mg/l	150	J	35	J	27		38		43		63		95		46	
Nitrate as N	mg/l																
Nitrite as N	mg/l																
Lab Specific Conductance	umhos/cm	2,300		2,200		830		970		1,300		1,700		2,000		1,300	

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

	Lab SDG	480-70790-1		480-70792-1		480-70792-1		480-70792-1		480-70792-1		480-70792-1		480-70792-1		480-70792-1	
	Location	PZ-18R		GW-10S		GW-24		GW-34D		GW-34D		GW-34SR		GW-43SR		GW-76S	
	Field Sample Date	11/4/2014 11:30		11/4/2014 11:55		11/4/2014 13:03		11/3/2014 12:00		11/3/2014 12:00		11/3/2014 10:25		11/3/2014 10:25		11/4/2014 10:08	
	Field Sample ID	OC-PZ-18R		OC GW 10S		OC GW 24		OC GW 34D		OC GW DUP 1		OC GW 34SR		OC GW 43SR		OC GW 76S	
	Qc Code	FS		FS		FS		FS		FD		FS		FS		FS	
		GW		GW		GW		GW		GW		GW		GW		GW	
Parameter	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Aluminum	ug/l	150	J	5,700		200	U	200	U	200	U	200	U	280		200	U
Chromium	ug/l	13		4.4	J	5	U	14		15		2.6	J	1.9	J	1.4	J
Sodium	ug/l																
Aluminum	ug/l																
Chromium	ug/l																
Sodium	ug/l																
Chloride	mg/l	8.3		2.9		8.6		0.37	J	0.38	J	1.4		9.6		9.4	
Sulfate	mg/l	2		9.9		2.7		5.2		5.4		6.4		1.3	J	1.9	J
Ammonia	mg/l	38		5.9		34		11	J	140	J	0.32		3.1		11	
Nitrate as N	mg/l																
Nitrite as N	mg/l																
Lab Specific Conductance	umhos/cm	840		370		590		190		180		73		770		430	

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG		480-70792-1	480-71175-1	480-71175-1	480-71175-1	480-71471-1	480-71471-1
Location		MP-2 #13	GW-201S	GW-35S	GW-CA1	PZ-24	PZ-25
Field Sample Date		11/3/2014 9:40	11/11/2014 9:30	11/6/2014 12:59	11/6/2014 11:45	11/14/2014 8:15	11/14/2014 8:50
Field Sample ID		OC MP2 PORT 13	OC-GW201S	OC-GW35S	OC-GWCA1	OC-PZ-24	OC-PZ-25
Qc Code		FS	FS	FS	FS	FS	FS
		GW	GW	GW	GW	GW	GW
Parameter	**Units**	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier
Aluminum	ug/l	500	60 J	84 J	200 U	200 U	200 U
Chromium	ug/l	20	28	49	17	31	11
Sodium	ug/l						
Aluminum	ug/l						
Chromium	ug/l						
Sodium	ug/l						
Chloride	mg/l	14	94	3.8 J	13	16	23
Sulfate	mg/l	1.7 J	1500	120	86	700	490
Ammonia	mg/l	1.2	150	11	3.4	43	49
Nitrate as N	mg/l						
Nitrite as N	mg/l						
Lab Specific Conductance	umhos/cm	1,000	3,000	560	550	1,700	1,300

Notes:

T = Total

D = Dissolved

FS = field sample

FD = field duplicate

U = not detected, value is the quantitation limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

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Checked by: CSR 6/25/15

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG		480-70932-1	480-70932-1	480-70932-1	480-70932-1	480-70932-1	480-70932-1
Location		ISCO1	ISCO2	ISCO3	PZ-16RR	PZ-17RRR	PZ-18R
Field Sample Date		11/6/2014 9:50	11/6/2014 8:25	11/6/2014 8:10	11/6/2014 8:45	11/6/2014 9:00	11/6/2014 9:35
Field Sample ID		OC-ISCO1	OC-ISCO2	OC-ISCO3	OC-PZ-16RRSW	OC-PZ-17RRSW	OC-DUP SW PZ18RSW
Qc Code		FS	FS	FS	FS	FS	FD
		SW	SW	SW	SW	SW	SW
Parameter	**Units**	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier	Result Qualifier
Aluminum	ug/l	180 J	120 J	200 U	610	460	180 J
Chromium	ug/l	10	32	5 U	160	200	10
Sodium	ug/l	91000	120000	100000	130000	130000	95000
Aluminum	ug/l	230	440	200 U	740	1900	250
Chromium	ug/l	13	66	5 U	180	420	13
Sodium	ug/l	94000	120000	100000	130000	130000	93000
Chloride	mg/l	160	160	210	180	180	160
Sulfate	mg/l	69	250	24 J	250	240	69
Ammonia	mg/l	15	37	1.3 J	40	39	15 J
Nitrate as N	mg/l	0.058	1.4	0.68	0.95	0.49	0.048 J
Nitrite as N	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Lab Specific Conductance	umhos/cm	810	1,200	890	1,300	1,300	780

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

	Lab SDG	480-70932-1		480-70932-1	
	Location	PZ-18R		SD-17	
	Field Sample Date	11/6/2014 9:35		11/6/2014 9:20	
	Field Sample ID	OC-PZ-18RSW		OC-SD-17	
	Qc Code	FS		FS	
		SW		SW	
Parameter	**Units**	Result	Qualifier	Result	Qualifier
Aluminum	ug/l	150	J	970	
Chromium	ug/l	10		290	
Sodium	ug/l	91000		130000	
Aluminum	ug/l	210		3600	
Chromium	ug/l	13		720	
Sodium	ug/l	92000		130000	
Chloride	mg/l	160		190	
Sulfate	mg/l	69		250	
Ammonia	mg/l	11	J	44	
Nitrate as N	mg/l	0.047	J	0.54	
Nitrite as N	mg/l	0.05	U	0.05	U
Lab Specific Conductance	umhos/cm	790		1,300	

Notes:

Created by: KMS 6/19/15

Checked by: CSR 6/25/15

T = Total

D = Dissolved

FS = field sample

FD = field duplicate

U = not detected, value is the quantitation limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 3
Validation Qualification Action Summary
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validated Qualifier	Val Reason Code	Result Units	Lab ID
OC-GW-202D	Ammonia	35		35	J	FD	mg/l	TALBFLO
OC-DUP GW 202D	Ammonia	150	B	150	J	FD	mg/l	TALBFLO
OC GW DUP 1	Ammonia	140	B	140	J	FD, MS-H, MS-L, MS-RPD	mg/l	TALBFLO
OC GW 34D	Ammonia	11		11	J	FD, MS-H, MS-L, MS-RPD	mg/l	TALBFLO
OC-PZ-18RSW	Ammonia	11		11	J	FD	mg/l	TALBFLO
OC-DUP SW PZ18RSW	Ammonia	15	B	15	J	FD	mg/l	TALBFLO
OC-ISCO3	Ammonia	1.3	B	1.3	J	MS-H	mg/l	TALBFLO

Validation Reason Codes:

FD = Field Duplicate limit exceeded
HT = Holding time for prep or analysis exceeded
MS-H = MS and/or MSD recovery high
MS-L = MS and/or MSD recovery low
MS-RPD = MS/MSD RPD limit exceeded

Created by: KMS 6/19/15
Checked by: CSR 6/25/15

TABLE 4 - Field Sample and Field Duplicate Comparison/RPD
Data Validation Report
November 2014 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Field Samp ID	OC GW 34D		OC GW DUP 1		
		Samp Date	11/03/2014		11/03/2014		
		Samp Time	12:00		12:00		
		Lab Sample ID	480-70792-3		480-70792-3		Calculated RPD
Specific Conductance	umhos/cm		190		180		5
Chloride	mg/l		0.37	J	0.38	J	-3
Sulfate	mg/l		5.2		5.4		-4
Ammonia	mg/l		13	H	140	B	**-166**
Aluminum	ug/l		200	U	200	U	0
Chromium	ug/l		14		15		-7

		Field Samp ID	OC-GW-202D		OC-DUP GW 202D		
		Samp Date	11/03/2014		11/03/2014		
		Samp Time	11:20		11:20		
		Lab Sample ID	480-70790-2		480-70790-9		Calculated RPD
Specific Conductance	umhos/cm		2200		2300		-4
Chloride	mg/l		4.3		4.2		2
Sulfate	mg/l		16		16		0
Ammonia	mg/l		35		150	B	**-124**
Aluminum	ug/l		2200		2300		-4
Chromium	ug/l		240		250		-4

		Field Samp ID	OC-PZ-18RSW		OC-DUP SW PZ18RSW		
		Samp Date	11/06/2014		11/06/2014		
		Samp Time	09:35		09:35		
		Lab Sample ID	480-70932-6		480-70932-8		Calculated RPD
Specific Conductance	umhos/cm		790		780		1
Chloride	mg/l		160		160		0
Sulfate	mg/l		69		69		0
Ammonia	mg/l		11		15	B	**-31**
Nitrate as N	mg/l		0.047	J	0.048	J	-2
Nitrite as N	mg/l		0.050	U	0.050	U	0
Aluminum	ug/l		150	J	180	J	-18
Chromium	ug/l		10		10		0
Sodium	ug/l		91000		95000		-4
Aluminum	ug/l		210		250		-17
Chromium	ug/l		13		13		0
Sodium	ug/l		92000		93000		-1

Created by: KMS 6/17/15
Checked by: CSR 6/29/15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-70790-1
Client Project/Site: Olin Chemical Groundwater Quarterly
Sampling Event: Groundwater Quarterly (March/August)
Revision: 1

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/15/2015 8:32:10 AM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-70790-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 11/6/2014 at 2:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 4.2º C.

HPLC/IC
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW-25 (480-70790-3) and OC-GW-78S (480-70790-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method Distill/Ammonia: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: OC-GW-202D (480-70790-2), OC-GW-202D (480-70790-2 MS) and OC-GW-202D (480-70790-2 MSD). The reporting limits (RLs) have been adjusted proportionately.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-70790-1**

Project Location: **Olin Chemical Groundwater Quarterly** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-70790-1 [1-9]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes	☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes	☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes	☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes	☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	☐ Yes	☐ No
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes	☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes	☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes	☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	■ Yes	☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes	■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 1/15/15 8:28

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Client Sample ID: OC-GW-202S — Lab Sample ID: 480-70790-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	4.8	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	4.5		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	5.0		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	27	B	5.0	2.5	mg/L	25		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
Specific Conductance	830		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202D — Lab Sample ID: 480-70790-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	240		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	2200		200	60	ug/L	1		6010	Dissolved
Chloride	4.3		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	16		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	35		20	10	mg/L	1		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
Specific Conductance	2200		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-25 — Lab Sample ID: 480-70790-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.6		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	210		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	35	J	40	7.0	mg/L	20		300.0	Total/NA
Ammonia	38	B	5.0	2.5	mg/L	25		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
Specific Conductance	970		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-78S — Lab Sample ID: 480-70790-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.6	J	5.0	1.0	ug/L	1		6010	Dissolved
Sulfate	480		100	17	mg/L	50		300.0	Total/NA
Ammonia	43	B	5.0	2.5	mg/L	25		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-79S — Lab Sample ID: 480-70790-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	23		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	280		200	60	ug/L	1		6010	Dissolved
Chloride	2.8		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	10		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	63	B	10	5.0	mg/L	50		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
Specific Conductance	1700		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Client Sample ID: OC-PZ-16RR — Lab Sample ID: 480-70790-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.0		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	3.9		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	11		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	95	B	10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17RRR — Lab Sample ID: 480-70790-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	6.5		5.0	1.0	ug/L	1		6010	Dissolved
Sulfate	8.6		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	46	B	10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18R — Lab Sample ID: 480-70790-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	13		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	150	J	200	60	ug/L	1		6010	Dissolved
Chloride	8.3		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	2.0		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	38	B	5.0	2.5	mg/L	25		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	840		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-DUP GW 202D — Lab Sample ID: 480-70790-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	250		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	2300		200	60	ug/L	1		6010	Dissolved
Chloride	4.2		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	16		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	150	B	20	10	mg/L	100		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-202S

Lab Sample ID: 480-70790-1

Date Collected: 11/03/14 10:35

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	4.8	J	5.0	1.0	ug/L		11/06/14 11:35	11/07/14 23:33	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/07/14 23:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.5		0.50	0.28	mg/L			11/17/14 17:36	1
Sulfate	5.0		2.0	0.35	mg/L			11/17/14 17:36	1
Ammonia	27	B	5.0	2.5	mg/L		11/11/14 19:58	11/12/14 18:55	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	830		1.0	1.0	umhos/cm			11/07/14 22:29	1

Client Sample ID: OC-GW-202D

Lab Sample ID: 480-70790-2

Date Collected: 11/03/14 11:20

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	240		5.0	1.0	ug/L		11/14/14 08:15	11/17/14 14:36	1
Aluminum	2200		200	60	ug/L		11/14/14 08:15	11/17/14 14:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.3		0.50	0.28	mg/L			11/17/14 17:46	1
Sulfate	16		2.0	0.35	mg/L			11/17/14 17:46	1
Ammonia	35		20	10	mg/L		11/17/14 21:09	11/19/14 10:41	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2200		1.0	1.0	umhos/cm			11/07/14 22:28	1

Client Sample ID: OC-GW-25

Lab Sample ID: 480-70790-3

Date Collected: 11/04/14 10:35

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	5.6		5.0	1.0	ug/L		11/06/14 11:35	11/07/14 23:50	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/07/14 23:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		10	5.6	mg/L			11/17/14 18:17	20
Sulfate	35	J	40	7.0	mg/L			11/17/14 18:17	20
Ammonia	38	B	5.0	2.5	mg/L		11/11/14 19:58	11/12/14 18:58	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	970		1.0	1.0	umhos/cm			11/07/14 22:26	1

Client Sample ID: OC-GW-78S

Lab Sample ID: 480-70790-4

Date Collected: 11/03/14 09:55

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	3.6	J	5.0	1.0	ug/L		11/06/14 11:35	11/07/14 23:53	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/07/14 23:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		25	14	mg/L			11/17/14 18:27	50
Sulfate	480		100	17	mg/L			11/17/14 18:27	50
Ammonia	43	B	5.0	2.5	mg/L		11/11/14 19:58	11/12/14 18:59	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1300		1.0	1.0	umhos/cm			11/07/14 22:25	1

Client Sample ID: OC-GW-79S

Lab Sample ID: 480-70790-5

Date Collected: 11/04/14 08:45

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	23		5.0	1.0	ug/L		11/06/14 11:35	11/08/14 00:04	1
Aluminum	280		200	60	ug/L		11/06/14 11:35	11/08/14 00:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.8		0.50	0.28	mg/L			11/17/14 19:18	1
Sulfate	10		2.0	0.35	mg/L			11/17/14 19:18	1
Ammonia	63	B	10	5.0	mg/L		11/11/14 19:58	11/12/14 18:59	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1700		1.0	1.0	umhos/cm			11/07/14 22:23	1

Client Sample ID: OC-PZ-16RR

Lab Sample ID: 480-70790-6

Date Collected: 11/04/14 09:10

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	5.0		5.0	1.0	ug/L		11/06/14 11:35	11/08/14 00:16	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/08/14 00:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.9		0.50	0.28	mg/L			11/17/14 19:28	1
Sulfate	11		2.0	0.35	mg/L			11/17/14 19:28	1
Ammonia	95	B	10	5.0	mg/L		11/11/14 19:58	11/12/14 19:00	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2000		1.0	1.0	umhos/cm			11/07/14 22:22	1

Client Sample ID: OC-PZ-17RRR

Lab Sample ID: 480-70790-7

Date Collected: 11/04/14 09:30

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	6.5		5.0	1.0	ug/L		11/06/14 11:35	11/08/14 00:07	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/08/14 00:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/17/14 19:38	1
Sulfate	8.6		2.0	0.35	mg/L			11/17/14 19:38	1
Ammonia	46	B	10	5.0	mg/L		11/11/14 19:58	11/12/14 19:01	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1300		1.0	1.0	umhos/cm			11/07/14 22:20	1

Client Sample ID: OC-PZ-18R

Lab Sample ID: 480-70790-8

Date Collected: 11/04/14 11:30

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	13		5.0	1.0	ug/L		11/06/14 11:35	11/08/14 00:10	1
Aluminum	150	J	200	60	ug/L		11/06/14 11:35	11/08/14 00:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.3		0.50	0.28	mg/L			11/17/14 19:48	1
Sulfate	2.0		2.0	0.35	mg/L			11/17/14 19:48	1
Ammonia	38	B	5.0	2.5	mg/L		11/11/14 19:58	11/12/14 19:02	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	840		1.0	1.0	umhos/cm			11/07/14 22:19	1

Client Sample ID: OC-DUP GW 202D

Lab Sample ID: 480-70790-9

Date Collected: 11/03/14 11:20

Matrix: Ground Water

Date Received: 11/06/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	250		5.0	1.0	ug/L		11/06/14 11:35	11/08/14 00:13	1
Aluminum	2300		200	60	ug/L		11/06/14 11:35	11/08/14 00:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.2		0.50	0.28	mg/L			11/17/14 19:58	1
Sulfate	16		2.0	0.35	mg/L			11/17/14 19:58	1
Ammonia	150	B	20	10	mg/L		11/11/14 19:58	11/12/14 19:09	100

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2300		1.0	1.0	umhos/cm			11/07/14 22:03	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-212462/1-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/06/14 11:35	11/07/14 22:37	1
Aluminum	ND		200	60	ug/L		11/06/14 11:35	11/07/14 22:37	1

Lab Sample ID: LCS 480-212462/2-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium			201	192		ug/L		96	80 - 120		
Aluminum			10000	10200		ug/L		102	80 - 120		

Lab Sample ID: LCSD 480-212462/3-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			201	190		ug/L		95	80 - 120	1	20
Aluminum			10000	9990		ug/L		100	80 - 120	2	20

Lab Sample ID: MB 480-213959/1-A
Matrix: Water
Analysis Batch: 214629

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 213959

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/14/14 08:15	11/17/14 13:26	1
Aluminum	ND		200	60	ug/L		11/14/14 08:15	11/17/14 13:26	1

Lab Sample ID: LCS 480-213959/2-A
Matrix: Water
Analysis Batch: 214629

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 213959

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium			200	195		ug/L		98	80 - 120		
Aluminum			10000	10200		ug/L		102	80 - 120		

Lab Sample ID: LCSD 480-213959/3-A
Matrix: Water
Analysis Batch: 214629

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 213959

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			200	195		ug/L		98	80 - 120	0	20
Aluminum			10000	10100		ug/L		101	80 - 120	1	20

Lab Sample ID: 480-70790-2 MS
Matrix: Ground Water
Analysis Batch: 214629

Client Sample ID: OC-GW-202D
Prep Type: Dissolved
Prep Batch: 213959

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium	240		200	432		ug/L		95	75 - 125		

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 480-70790-2 MS
Matrix: Ground Water
Analysis Batch: 214629

Client Sample ID: OC-GW-202D
Prep Type: Dissolved
Prep Batch: 213959

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2200		10000	12400		ug/L		102	75 - 125

Lab Sample ID: 480-70790-2 MSD
Matrix: Ground Water
Analysis Batch: 214629

Client Sample ID: OC-GW-202D
Prep Type: Dissolved
Prep Batch: 213959

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	240		200	440		ug/L		99	75 - 125	2	20
Aluminum	2200		10000	12500		ug/L		103	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-214490/4
Matrix: Water
Analysis Batch: 214490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/17/14 14:24	1
Sulfate	ND		2.0	0.35	mg/L			11/17/14 14:24	1

Lab Sample ID: LCS 480-214490/3
Matrix: Water
Analysis Batch: 214490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.9		mg/L		95	83 - 121
Sulfate	20.0	19.1		mg/L		96	80 - 129

Lab Sample ID: 480-70790-2 MS
Matrix: Ground Water
Analysis Batch: 214490

Client Sample ID: OC-GW-202D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	4.3		25.0	29.2		mg/L		100	83 - 121
Sulfate	16		25.0	39.1		mg/L		94	80 - 129

Lab Sample ID: 480-70790-2 MSD
Matrix: Ground Water
Analysis Batch: 214490

Client Sample ID: OC-GW-202D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	4.3		25.0	29.2		mg/L		100	83 - 121	0	20
Sulfate	16		25.0	41.0		mg/L		102	80 - 129	5	20

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 480-214497/32
Matrix: Water
Analysis Batch: 214497

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/17/14 19:08	1
Sulfate	ND		2.0	0.35	mg/L			11/17/14 19:08	1

Lab Sample ID: LCS 480-214497/31
Matrix: Water
Analysis Batch: 214497

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.8		mg/L		94	83 - 121
Sulfate	20.0	19.2		mg/L		96	80 - 129

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-213449/2-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 213449

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.122	J	0.20	0.10	mg/L		11/11/14 19:58	11/12/14 18:49	1

Lab Sample ID: LCS 480-213449/1-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 213449

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.10		mg/L		110	90 - 110

Lab Sample ID: MB 480-214570/2-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214570

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/17/14 21:09	11/19/14 09:59	1

Lab Sample ID: LCS 480-214570/1-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 214570

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.06		mg/L		106	90 - 110

Lab Sample ID: 480-70790-2 MS
Matrix: Ground Water
Analysis Batch: 214913

Client Sample ID: OC-GW-202D
Prep Type: Total/NA
Prep Batch: 214570

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	35		50.0	93.3	F1	mg/L		116	90 - 110

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: 480-70790-2 MSD
Matrix: Ground Water
Analysis Batch: 214913

Client Sample ID: OC-GW-202D
Prep Type: Total/NA
Prep Batch: 214570

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	35		50.0	83.0		mg/L		96	90 - 110	12	20

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-212865/23
Matrix: Water
Analysis Batch: 212865

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	978		umhos/cm		98	90 - 110

Lab Sample ID: LCS 480-212869/1
Matrix: Water
Analysis Batch: 212869

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	957		umhos/cm		96	90 - 110

Metals

Prep Batch: 212462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Dissolved	Ground Water	3005A	
480-70790-3	OC-GW-25	Dissolved	Ground Water	3005A	
480-70790-4	OC-GW-78S	Dissolved	Ground Water	3005A	
480-70790-5	OC-GW-79S	Dissolved	Ground Water	3005A	
480-70790-6	OC-PZ-16RR	Dissolved	Ground Water	3005A	
480-70790-7	OC-PZ-17RRR	Dissolved	Ground Water	3005A	
480-70790-8	OC-PZ-18R	Dissolved	Ground Water	3005A	
480-70790-9	OC-DUP GW 202D	Dissolved	Ground Water	3005A	
LCS 480-212462/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-212462/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-212462/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 212903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Dissolved	Ground Water	6010	212462
480-70790-3	OC-GW-25	Dissolved	Ground Water	6010	212462
480-70790-4	OC-GW-78S	Dissolved	Ground Water	6010	212462
480-70790-5	OC-GW-79S	Dissolved	Ground Water	6010	212462
480-70790-6	OC-PZ-16RR	Dissolved	Ground Water	6010	212462
480-70790-7	OC-PZ-17RRR	Dissolved	Ground Water	6010	212462
480-70790-8	OC-PZ-18R	Dissolved	Ground Water	6010	212462
480-70790-9	OC-DUP GW 202D	Dissolved	Ground Water	6010	212462
LCS 480-212462/2-A	Lab Control Sample	Total Recoverable	Water	6010	212462
LCSD 480-212462/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	212462
MB 480-212462/1-A	Method Blank	Total Recoverable	Water	6010	212462

Prep Batch: 213959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-2	OC-GW-202D	Dissolved	Ground Water	3005A	
480-70790-2 MS	OC-GW-202D	Dissolved	Ground Water	3005A	
480-70790-2 MSD	OC-GW-202D	Dissolved	Ground Water	3005A	
LCS 480-213959/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-213959/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-213959/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 214629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-2	OC-GW-202D	Dissolved	Ground Water	6010	213959
480-70790-2 MS	OC-GW-202D	Dissolved	Ground Water	6010	213959
480-70790-2 MSD	OC-GW-202D	Dissolved	Ground Water	6010	213959
LCS 480-213959/2-A	Lab Control Sample	Total Recoverable	Water	6010	213959
LCSD 480-213959/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	213959
MB 480-213959/1-A	Method Blank	Total Recoverable	Water	6010	213959

General Chemistry

Analysis Batch: 212865

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-9	OC-DUP GW 202D	Total/NA	Ground Water	SM 2510B	
LCS 480-212865/23	Lab Control Sample	Total/NA	Water	SM 2510B	

General Chemistry (Continued)

Analysis Batch: 212869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Total/NA	Ground Water	SM 2510B	
480-70790-2	OC-GW-202D	Total/NA	Ground Water	SM 2510B	
480-70790-3	OC-GW-25	Total/NA	Ground Water	SM 2510B	
480-70790-4	OC-GW-78S	Total/NA	Ground Water	SM 2510B	
480-70790-5	OC-GW-79S	Total/NA	Ground Water	SM 2510B	
480-70790-6	OC-PZ-16RR	Total/NA	Ground Water	SM 2510B	
480-70790-7	OC-PZ-17RRR	Total/NA	Ground Water	SM 2510B	
480-70790-8	OC-PZ-18R	Total/NA	Ground Water	SM 2510B	
LCS 480-212869/1	Lab Control Sample	Total/NA	Water	SM 2510B	

Prep Batch: 213449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Total/NA	Ground Water	Distill/Ammonia	
480-70790-3	OC-GW-25	Total/NA	Ground Water	Distill/Ammonia	
480-70790-4	OC-GW-78S	Total/NA	Ground Water	Distill/Ammonia	
480-70790-5	OC-GW-79S	Total/NA	Ground Water	Distill/Ammonia	
480-70790-6	OC-PZ-16RR	Total/NA	Ground Water	Distill/Ammonia	
480-70790-7	OC-PZ-17RRR	Total/NA	Ground Water	Distill/Ammonia	
480-70790-8	OC-PZ-18R	Total/NA	Ground Water	Distill/Ammonia	
480-70790-9	OC-DUP GW 202D	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-213449/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 213731

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Total/NA	Ground Water	350.1	213449
480-70790-3	OC-GW-25	Total/NA	Ground Water	350.1	213449
480-70790-4	OC-GW-78S	Total/NA	Ground Water	350.1	213449
480-70790-5	OC-GW-79S	Total/NA	Ground Water	350.1	213449
480-70790-6	OC-PZ-16RR	Total/NA	Ground Water	350.1	213449
480-70790-7	OC-PZ-17RRR	Total/NA	Ground Water	350.1	213449
480-70790-8	OC-PZ-18R	Total/NA	Ground Water	350.1	213449
480-70790-9	OC-DUP GW 202D	Total/NA	Ground Water	350.1	213449
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	350.1	213449
MB 480-213449/2-A	Method Blank	Total/NA	Water	350.1	213449

Analysis Batch: 214490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-1	OC-GW-202S	Total/NA	Ground Water	300.0	
480-70790-2	OC-GW-202D	Total/NA	Ground Water	300.0	
480-70790-2 MS	OC-GW-202D	Total/NA	Ground Water	300.0	
480-70790-2 MSD	OC-GW-202D	Total/NA	Ground Water	300.0	
480-70790-3	OC-GW-25	Total/NA	Ground Water	300.0	
480-70790-4	OC-GW-78S	Total/NA	Ground Water	300.0	
LCS 480-214490/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-214490/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 214497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-5	OC-GW-79S	Total/NA	Ground Water	300.0	
480-70790-6	OC-PZ-16RR	Total/NA	Ground Water	300.0	

General Chemistry (Continued)

Analysis Batch: 214497 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-7	OC-PZ-17RRR	Total/NA	Ground Water	300.0	
480-70790-8	OC-PZ-18R	Total/NA	Ground Water	300.0	
480-70790-9	OC-DUP GW 202D	Total/NA	Ground Water	300.0	
LCS 480-214497/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-214497/32	Method Blank	Total/NA	Water	300.0	

Prep Batch: 214570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-2	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
480-70790-2 MS	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
480-70790-2 MSD	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214570/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 214913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70790-2	OC-GW-202D	Total/NA	Ground Water	350.1	214570
480-70790-2 MS	OC-GW-202D	Total/NA	Ground Water	350.1	214570
480-70790-2 MSD	OC-GW-202D	Total/NA	Ground Water	350.1	214570
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	350.1	214570
MB 480-214570/2-A	Method Blank	Total/NA	Water	350.1	214570

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Client Sample ID: OC-GW-202S

Lab Sample ID: 480-70790-1

Date Collected: 11/03/14 10:35

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:33	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214490	11/17/14 17:36	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		25	213731	11/12/14 18:55	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:29	VAJ	TAL BUF

Client Sample ID: OC-GW-202D

Lab Sample ID: 480-70790-2

Date Collected: 11/03/14 11:20

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			213959	11/14/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	214629	11/17/14 14:36	TRB	TAL BUF
Total/NA	Analysis	300.0		1	214490	11/17/14 17:46	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214570	11/17/14 21:09	RS	TAL BUF
Total/NA	Analysis	350.1		1	214913	11/19/14 10:41	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:28	VAJ	TAL BUF

Client Sample ID: OC-GW-25

Lab Sample ID: 480-70790-3

Date Collected: 11/04/14 10:35

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:50	LMH	TAL BUF
Total/NA	Analysis	300.0		20	214490	11/17/14 18:17	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		25	213731	11/12/14 18:58	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:26	VAJ	TAL BUF

Client Sample ID: OC-GW-78S

Lab Sample ID: 480-70790-4

Date Collected: 11/03/14 09:55

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:53	LMH	TAL BUF
Total/NA	Analysis	300.0		50	214490	11/17/14 18:27	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		25	213731	11/12/14 18:59	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:25	VAJ	TAL BUF

Client Sample ID: OC-GW-79S

Lab Sample ID: 480-70790-5

Date Collected: 11/04/14 08:45

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/08/14 00:04	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 19:18	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		50	213731	11/12/14 18:59	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:23	VAJ	TAL BUF

Client Sample ID: OC-PZ-16RR

Lab Sample ID: 480-70790-6

Date Collected: 11/04/14 09:10

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/08/14 00:16	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 19:28	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		50	213731	11/12/14 19:00	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:22	VAJ	TAL BUF

Client Sample ID: OC-PZ-17RRR

Lab Sample ID: 480-70790-7

Date Collected: 11/04/14 09:30

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/08/14 00:07	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 19:38	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		50	213731	11/12/14 19:01	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:20	VAJ	TAL BUF

Client Sample ID: OC-PZ-18R

Lab Sample ID: 480-70790-8

Date Collected: 11/04/14 11:30

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/08/14 00:10	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 19:48	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		25	213731	11/12/14 19:02	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:19	VAJ	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Client Sample ID: OC-DUP GW 202D
Date Collected: 11/03/14 11:20
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70790-9
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/08/14 00:13	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 19:58	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		100	213731	11/12/14 19:09	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212865	11/07/14 22:03	VAJ	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Aluminum
6010	3005A	Ground Water	Chromium
SM 2510B		Ground Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Quarterly

TestAmerica Job ID: 480-70790-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70790-1	OC-GW-202S	Ground Water	11/03/14 10:35	11/06/14 02:00
480-70790-2	OC-GW-202D	Ground Water	11/03/14 11:20	11/06/14 02:00
480-70790-3	OC-GW-25	Ground Water	11/04/14 10:35	11/06/14 02:00
480-70790-4	OC-GW-78S	Ground Water	11/03/14 09:55	11/06/14 02:00
480-70790-5	OC-GW-79S	Ground Water	11/04/14 08:45	11/06/14 02:00
480-70790-6	OC-PZ-16RR	Ground Water	11/04/14 09:10	11/06/14 02:00
480-70790-7	OC-PZ-17RRR	Ground Water	11/04/14 09:30	11/06/14 02:00
480-70790-8	OC-PZ-18R	Ground Water	11/04/14 11:30	11/06/14 02:00
480-70790-9	OC-DUP GW 202D	Ground Water	11/03/14 11:20	11/06/14 02:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70790-1

Login Number: 70790

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp
Samples received within 48 hours of sampling.	False	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: BRIAN Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56527-8566.1
Client Contact: Mr. James Cashwell	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 2
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (Marc	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate

480-70790 Chain of Custody

fy)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Dissolved Al/Cr	2510B - Specific Conductance	Total	Special Instructions/Note:
Preservation Code:							N	S	D	N		
OC-GW-202S	11-3-14	10:35	G	Water	Y		X	X	X	X	4	
OC-GW-202D	11-3-14	11:20	G	Water	Y	Y	X	X	X	X	4	
OC-GW-25	11-4-14	10:35	G	Water	Y		X	X	X	X	4	
OC-GW-78S	11-3-14	9:55	G	Water	Y		X	X	X	X	4	
OC-GW-79S	11-4-14	8:45	G	Water	Y		X	X	X	X	4	
OC-PZ-16RR	11-4-14	9:10	G	Water	Y		X	X	X	X	4	
OC-PZ-17RR R	11-4-14	9:30	G	Water	Y		X	X	X	X	4	
OC-PZ-18R	11-4-14	11:30	G	Water	Y		X	X	X	X	4	
OC-GW202D MS	11-3-14	11:20	G	Water	Y	Y	X	X	X	X	4	
OC-GW202D MSD	11-3-14	11:20	G	Water	Y	Y	X	X	X	X	4	
OC-DUP GW 202D	11-3-14	11:20	G	Water	Y	Y	X	X	X	X	4	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11-5-14 13:20			11/5/14 1320	
2		11/5/14 1630			11/06/14 0200	TA
3						

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 4.2 2.2 #1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-70792-1
Client Project/Site: Olin Chemical Groundwater

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/5/2014 12:21:42 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Job ID: 480-70792-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 11/6/2014 6:18 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.2º C.

Sample OC GW 43SR (480-70792-8) was received but not listed on COC. Sample id, time and date of collection listed on sample container labels was used for sample login. Per client sample was run.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 350.1: The method blank for batch 214151 contained ammonia above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.OC GW 34SR (480-70792-5), OC GW 43SR (480-70792-8), OC GW 76S (480-70792-7), OC GW DUP 1 (480-70792-4), OC MP2 PORT 13 (480-70792-6)

Method 350.1: Reanalysis of the following samples were performed outside of the analytical holding time due to the original analysis yeilding an RPD failure for the MS/MSD. Sample base and MS/MSD had to be reprepared and reanalyzed. : OC GW 34D (480-70792-3), OC GW 34D (480-70792-3 MS), OC GW 34D (480-70792-3 MSD). Both sets of data have been reported.

Method 350.1: The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 214913 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) precision was within acceptance limits.OC GW 34D (480-70792-3 MS), OC GW 34D (480-70792-3 MSD)

Method(Distill/Ammonia: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: OC GW 34D (480-70792-3), OC GW 34D (480-70792-3 MS), OC GW 34D (480-70792-3 MSD). The reporting limits (RLs) have been adjusted proportionately.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-70792-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-70792-1[1-8]

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Project Manager

Printed Name: Becky Mason Date: 12/5/14 12:19

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC GW 10S — Lab Sample ID: 480-70792-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	4.4	J	5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	5700		200	60	ug/L	1		6010	Dissolved
Chloride	2.9		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	9.9		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	5.9	B	1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	370		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW 24 — Lab Sample ID: 480-70792-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	8.6		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	2.7		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	34	B	10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	590		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW 34D — Lab Sample ID: 480-70792-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	14		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	0.37	J	0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	5.2		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	11		2.0	1.0	mg/L	1		350.1	Total/NA
Ammonia	13	H	2.0	1.0	mg/L	1		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	190		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW DUP 1 — Lab Sample ID: 480-70792-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	15		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	0.38	J	0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	5.4		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	140	B	20	10	mg/L	100		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	180		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW 34SR — Lab Sample ID: 480-70792-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	2.6	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	1.4		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	6.4		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	0.32	B	0.20	0.10	mg/L	1		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	73		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC MP2 PORT 13 — Lab Sample ID: 480-70792-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	20		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	500		200	60	ug/L	1		6010	Dissolved
Chloride	14		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	1.7	J	2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	1.2	B	0.20	0.10	mg/L	1		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW 76S — Lab Sample ID: 480-70792-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.4	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	9.4		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	1.9	J	2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	11	B	2.0	1.0	mg/L	10		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	430		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC GW 43SR — Lab Sample ID: 480-70792-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.9	J	5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	280		200	60	ug/L	1		6010	Dissolved
Chloride	9.6		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	1.3	J	2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	3.1	B	0.40	0.20	mg/L	2		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	770		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC GW 10S

Lab Sample ID: 480-70792-1

Date Collected: 11/04/14 11:55

Matrix: Ground Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	4.4	J	5.0	1.0	ug/L		11/07/14 08:15	11/07/14 21:53	1
Aluminum	5700		200	60	ug/L		11/07/14 08:15	11/07/14 21:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.9		0.50	0.28	mg/L			11/17/14 20:08	1
Sulfate	9.9		2.0	0.35	mg/L			11/17/14 20:08	1
Ammonia	5.9	B	1.0	0.50	mg/L		11/11/14 19:58	11/12/14 19:04	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	370		1.0	1.0	umhos/cm			11/07/14 22:01	1

Client Sample ID: OC GW 24

Lab Sample ID: 480-70792-2

Date Collected: 11/04/14 13:03

Matrix: Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/07/14 08:15	11/07/14 21:55	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 21:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.6		0.50	0.28	mg/L			11/17/14 20:19	1
Sulfate	2.7		2.0	0.35	mg/L			11/17/14 20:19	1
Ammonia	34	B	10	5.0	mg/L		11/11/14 19:58	11/12/14 19:04	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	590		1.0	1.0	umhos/cm			11/07/14 22:00	1

Client Sample ID: OC GW 34D

Lab Sample ID: 480-70792-3

Date Collected: 11/03/14 12:00

Matrix: Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	14		5.0	1.0	ug/L		11/07/14 08:15	11/07/14 21:58	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 21:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.37	J	0.50	0.28	mg/L			11/17/14 20:29	1
Sulfate	5.2		2.0	0.35	mg/L			11/17/14 20:29	1
Ammonia	11		2.0	1.0	mg/L		11/18/14 12:00	11/19/14 12:09	1
Ammonia	13	H	2.0	1.0	mg/L		12/01/14 22:42	12/02/14 00:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	190		1.0	1.0	umhos/cm			11/07/14 21:58	1

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC GW DUP 1

Lab Sample ID: 480-70792-4

Date Collected: 11/03/14 12:00

Matrix: Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	15		5.0	1.0	ug/L		11/07/14 08:15	11/07/14 22:12	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 22:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.38	J	0.50	0.28	mg/L			11/17/14 21:08	1
Sulfate	5.4		2.0	0.35	mg/L			11/17/14 21:08	1
Ammonia	140	B	20	10	mg/L		11/13/14 17:00	11/14/14 11:14	100

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	180		1.0	1.0	umhos/cm			11/07/14 22:35	1

Client Sample ID: OC GW 34SR

Lab Sample ID: 480-70792-5

Date Collected: 11/03/14 10:25

Matrix: Ground Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	2.6	J	5.0	1.0	ug/L		11/07/14 08:15	11/07/14 22:23	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 22:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.4		0.50	0.28	mg/L			11/17/14 21:38	1
Sulfate	6.4		2.0	0.35	mg/L			11/17/14 21:38	1
Ammonia	0.32	B	0.20	0.10	mg/L		11/13/14 17:00	11/14/14 11:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	73		1.0	1.0	umhos/cm			11/07/14 22:36	1

Client Sample ID: OC MP2 PORT 13

Lab Sample ID: 480-70792-6

Date Collected: 11/03/14 09:40

Matrix: Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	20		5.0	1.0	ug/L		11/07/14 08:15	11/07/14 22:26	1
Aluminum	500		200	60	ug/L		11/07/14 08:15	11/07/14 22:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14		0.50	0.28	mg/L			11/17/14 21:48	1
Sulfate	1.7	J	2.0	0.35	mg/L			11/17/14 21:48	1
Ammonia	1.2	B	0.20	0.10	mg/L		11/13/14 17:00	11/14/14 11:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1000		1.0	1.0	umhos/cm			11/07/14 22:38	1

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC GW 76S

Lab Sample ID: 480-70792-7

Date Collected: 11/04/14 10:08

Matrix: Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.4	J	5.0	1.0	ug/L		11/07/14 08:15	11/07/14 22:29	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 22:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.4		0.50	0.28	mg/L			11/17/14 21:58	1
Sulfate	1.9	J	2.0	0.35	mg/L			11/17/14 21:58	1
Ammonia	11	B	2.0	1.0	mg/L		11/13/14 17:00	11/14/14 11:39	10

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	430		1.0	1.0	umhos/cm			11/07/14 22:39	1

Client Sample ID: OC GW 43SR

Lab Sample ID: 480-70792-8

Date Collected: 11/03/14 10:25

Matrix: Ground Water

Date Received: 11/06/14 06:18

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.9	J	5.0	1.0	ug/L		11/07/14 08:15	11/07/14 22:32	1
Aluminum	280		200	60	ug/L		11/07/14 08:15	11/07/14 22:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.6		0.50	0.28	mg/L			11/17/14 22:09	1
Sulfate	1.3	J	2.0	0.35	mg/L			11/17/14 22:09	1
Ammonia	3.1	B	0.40	0.20	mg/L		11/13/14 17:00	11/14/14 11:40	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	770		1.0	1.0	umhos/cm			11/07/14 22:41	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-212453/1-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 212453

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/07/14 08:15	11/07/14 21:36	1
Aluminum	ND		200	60	ug/L		11/07/14 08:15	11/07/14 21:36	1

Lab Sample ID: LCS 480-212453/2-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 212453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	201	190		ug/L		95	80 - 120
Aluminum	10000	10000		ug/L		100	80 - 120

Lab Sample ID: LCSD 480-212453/3-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 212453

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	201	189		ug/L		94	80 - 120	0	20
Aluminum	10000	9870		ug/L		99	80 - 120	1	20

Lab Sample ID: 480-70792-3 MS
Matrix: Water
Analysis Batch: 212903

Client Sample ID: OC GW 34D
Prep Type: Dissolved
Prep Batch: 212453

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	14		201	204		ug/L		94	75 - 125
Aluminum	ND		10000	9870		ug/L		99	75 - 125

Lab Sample ID: 480-70792-3 MSD
Matrix: Water
Analysis Batch: 212903

Client Sample ID: OC GW 34D
Prep Type: Dissolved
Prep Batch: 212453

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	14		201	206		ug/L		96	75 - 125	1	20
Aluminum	ND		10000	9940		ug/L		99	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-214497/32
Matrix: Water
Analysis Batch: 214497

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/17/14 19:08	1
Sulfate	ND		2.0	0.35	mg/L			11/17/14 19:08	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-214497/31
Matrix: Water
Analysis Batch: 214497

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.8		mg/L		94	83 - 121
Sulfate	20.0	19.2		mg/L		96	80 - 129

Lab Sample ID: 480-70792-3 MS
Matrix: Water
Analysis Batch: 214497

Client Sample ID: OC GW 34D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	0.37	J	25.0	24.7		mg/L		97	83 - 121
Sulfate	5.2		25.0	29.5		mg/L		97	80 - 129

Lab Sample ID: 480-70792-3 MSD
Matrix: Water
Analysis Batch: 214497

Client Sample ID: OC GW 34D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	0.37	J	25.0	24.9		mg/L		98	83 - 121	1	20
Sulfate	5.2		25.0	29.8		mg/L		98	80 - 129	1	20

Lab Sample ID: 480-70792-8 MS
Matrix: Ground Water
Analysis Batch: 214497

Client Sample ID: OC GW 43SR
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	9.6		25.0	33.8		mg/L		97	83 - 121
Sulfate	1.3	J	25.0	25.5		mg/L		97	80 - 129

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-213449/2-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 213449

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.122	J	0.20	0.10	mg/L		11/11/14 19:58	11/12/14 18:49	1

Lab Sample ID: LCS 480-213449/1-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 213449

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.10		mg/L		110	90 - 110

Lab Sample ID: 480-70792-2 MS
Matrix: Water
Analysis Batch: 213731

Client Sample ID: OC GW 24
Prep Type: Total/NA
Prep Batch: 213449

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	34	B	5.00	28.2	4	mg/L		-107	90 - 110

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: MB 480-214119/1-A
Matrix: Water
Analysis Batch: 214151

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214119

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.120	J	0.20	0.10	mg/L		11/13/14 17:00	11/14/14 11:09	1

Lab Sample ID: LCS 480-214119/2-A
Matrix: Water
Analysis Batch: 214151

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 214119

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.04		mg/L		104	90 - 110

Lab Sample ID: MB 480-214570/2-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214570

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/17/14 21:09	11/19/14 09:59	1

Lab Sample ID: LCS 480-214570/1-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 214570

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.06		mg/L		106	90 - 110

Lab Sample ID: MB 480-214767/2-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214767

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/18/14 12:00	11/19/14 10:00	1

Lab Sample ID: LCS 480-214767/1-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 214767

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.05		mg/L		105	90 - 110

Lab Sample ID: 480-70792-3 MS
Matrix: Water
Analysis Batch: 214913

Client Sample ID: OC GW 34D
Prep Type: Total/NA
Prep Batch: 214767

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	11		5.00	17.5	F1	mg/L		138	90 - 110

Lab Sample ID: 480-70792-3 MSD
Matrix: Water
Analysis Batch: 214913

Client Sample ID: OC GW 34D
Prep Type: Total/NA
Prep Batch: 214767

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	11		5.00	14.1	F1 F2	mg/L		70	90 - 110	22	20

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Lab Sample ID: MB 480-216644/2-A
Matrix: Water
Analysis Batch: 216655

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 216644

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		12/01/14 22:42	12/02/14 00:31	1

Lab Sample ID: LCS 480-216644/1-A
Matrix: Water
Analysis Batch: 216655

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 216644

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.10		mg/L		110	90 - 110

Lab Sample ID: 480-70792-3 MS
Matrix: Water
Analysis Batch: 216655

Client Sample ID: OC GW 34D
Prep Type: Total/NA
Prep Batch: 216644

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	13	H	5.00	17.8	H	mg/L		90	90 - 110

Lab Sample ID: 480-70792-3 MSD
Matrix: Water
Analysis Batch: 216655

Client Sample ID: OC GW 34D
Prep Type: Total/NA
Prep Batch: 216644

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	13	H	5.00	18.5	H	mg/L		104	90 - 110	4	20

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-212865/23
Matrix: Water
Analysis Batch: 212865

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	978		umhos/cm		98	90 - 110

Lab Sample ID: LCS 480-212869/1
Matrix: Water
Analysis Batch: 212869

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	957		umhos/cm		96	90 - 110

Metals

Prep Batch: 212453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Dissolved	Ground Water	3005A	
480-70792-2	OC GW 24	Dissolved	Water	3005A	
480-70792-3	OC GW 34D	Dissolved	Water	3005A	
480-70792-3 MS	OC GW 34D	Dissolved	Water	3005A	
480-70792-3 MSD	OC GW 34D	Dissolved	Water	3005A	
480-70792-4	OC GW DUP 1	Dissolved	Water	3005A	
480-70792-5	OC GW 34SR	Dissolved	Ground Water	3005A	
480-70792-6	OC MP2 PORT 13	Dissolved	Water	3005A	
480-70792-7	OC GW 76S	Dissolved	Water	3005A	
480-70792-8	OC GW 43SR	Dissolved	Ground Water	3005A	
LCS 480-212453/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-212453/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-212453/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 212903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Dissolved	Ground Water	6010	212453
480-70792-2	OC GW 24	Dissolved	Water	6010	212453
480-70792-3	OC GW 34D	Dissolved	Water	6010	212453
480-70792-3 MS	OC GW 34D	Dissolved	Water	6010	212453
480-70792-3 MSD	OC GW 34D	Dissolved	Water	6010	212453
480-70792-4	OC GW DUP 1	Dissolved	Water	6010	212453
480-70792-5	OC GW 34SR	Dissolved	Ground Water	6010	212453
480-70792-6	OC MP2 PORT 13	Dissolved	Water	6010	212453
480-70792-7	OC GW 76S	Dissolved	Water	6010	212453
480-70792-8	OC GW 43SR	Dissolved	Ground Water	6010	212453
LCS 480-212453/2-A	Lab Control Sample	Total Recoverable	Water	6010	212453
LCSD 480-212453/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	212453
MB 480-212453/1-A	Method Blank	Total Recoverable	Water	6010	212453

General Chemistry

Analysis Batch: 212865

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Total/NA	Ground Water	SM 2510B	
480-70792-2	OC GW 24	Total/NA	Water	SM 2510B	
480-70792-3	OC GW 34D	Total/NA	Water	SM 2510B	
LCS 480-212865/23	Lab Control Sample	Total/NA	Water	SM 2510B	

Analysis Batch: 212869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-4	OC GW DUP 1	Total/NA	Water	SM 2510B	
480-70792-5	OC GW 34SR	Total/NA	Ground Water	SM 2510B	
480-70792-6	OC MP2 PORT 13	Total/NA	Water	SM 2510B	
480-70792-7	OC GW 76S	Total/NA	Water	SM 2510B	
480-70792-8	OC GW 43SR	Total/NA	Ground Water	SM 2510B	
LCS 480-212869/1	Lab Control Sample	Total/NA	Water	SM 2510B	

General Chemistry (Continued)

Prep Batch: 213449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Total/NA	Ground Water	Distill/Ammonia	
480-70792-2	OC GW 24	Total/NA	Water	Distill/Ammonia	
480-70792-2 MS	OC GW 24	Total/NA	Water	Distill/Ammonia	
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-213449/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 213731

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Total/NA	Ground Water	350.1	213449
480-70792-2	OC GW 24	Total/NA	Water	350.1	213449
480-70792-2 MS	OC GW 24	Total/NA	Water	350.1	213449
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	350.1	213449
MB 480-213449/2-A	Method Blank	Total/NA	Water	350.1	213449

Prep Batch: 214119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-4	OC GW DUP 1	Total/NA	Water	Distill/Ammonia	
480-70792-5	OC GW 34SR	Total/NA	Ground Water	Distill/Ammonia	
480-70792-6	OC MP2 PORT 13	Total/NA	Water	Distill/Ammonia	
480-70792-7	OC GW 76S	Total/NA	Water	Distill/Ammonia	
480-70792-8	OC GW 43SR	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-214119/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214119/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 214151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-4	OC GW DUP 1	Total/NA	Water	350.1	214119
480-70792-5	OC GW 34SR	Total/NA	Ground Water	350.1	214119
480-70792-6	OC MP2 PORT 13	Total/NA	Water	350.1	214119
480-70792-7	OC GW 76S	Total/NA	Water	350.1	214119
480-70792-8	OC GW 43SR	Total/NA	Ground Water	350.1	214119
LCS 480-214119/2-A	Lab Control Sample	Total/NA	Water	350.1	214119
MB 480-214119/1-A	Method Blank	Total/NA	Water	350.1	214119

Analysis Batch: 214497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-1	OC GW 10S	Total/NA	Ground Water	300.0	
480-70792-2	OC GW 24	Total/NA	Water	300.0	
480-70792-3	OC GW 34D	Total/NA	Water	300.0	
480-70792-3 MS	OC GW 34D	Total/NA	Water	300.0	
480-70792-3 MSD	OC GW 34D	Total/NA	Water	300.0	
480-70792-4	OC GW DUP 1	Total/NA	Water	300.0	
480-70792-5	OC GW 34SR	Total/NA	Ground Water	300.0	
480-70792-6	OC MP2 PORT 13	Total/NA	Water	300.0	
480-70792-7	OC GW 76S	Total/NA	Water	300.0	
480-70792-8	OC GW 43SR	Total/NA	Ground Water	300.0	
480-70792-8 MS	OC GW 43SR	Total/NA	Ground Water	300.0	
LCS 480-214497/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-214497/32	Method Blank	Total/NA	Water	300.0	

General Chemistry (Continued)

Prep Batch: 214570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214570/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 214767

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-3	OC GW 34D	Total/NA	Water	Distill/Ammonia	
480-70792-3 MS	OC GW 34D	Total/NA	Water	Distill/Ammonia	
480-70792-3 MSD	OC GW 34D	Total/NA	Water	Distill/Ammonia	
LCS 480-214767/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214767/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 214913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-3	OC GW 34D	Total/NA	Water	350.1	214767
480-70792-3 MS	OC GW 34D	Total/NA	Water	350.1	214767
480-70792-3 MSD	OC GW 34D	Total/NA	Water	350.1	214767
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	350.1	214570
LCS 480-214767/1-A	Lab Control Sample	Total/NA	Water	350.1	214767
MB 480-214570/2-A	Method Blank	Total/NA	Water	350.1	214570
MB 480-214767/2-A	Method Blank	Total/NA	Water	350.1	214767

Prep Batch: 216644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-3	OC GW 34D	Total/NA	Water	Distill/Ammonia	
480-70792-3 MS	OC GW 34D	Total/NA	Water	Distill/Ammonia	
480-70792-3 MSD	OC GW 34D	Total/NA	Water	Distill/Ammonia	
LCS 480-216644/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-216644/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 216655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70792-3	OC GW 34D	Total/NA	Water	350.1	216644
480-70792-3 MS	OC GW 34D	Total/NA	Water	350.1	216644
480-70792-3 MSD	OC GW 34D	Total/NA	Water	350.1	216644
LCS 480-216644/1-A	Lab Control Sample	Total/NA	Water	350.1	216644
MB 480-216644/2-A	Method Blank	Total/NA	Water	350.1	216644

Client Sample ID: OC GW 10S

Lab Sample ID: 480-70792-1

Date Collected: 11/04/14 11:55

Matrix: Ground Water

Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 21:53	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 20:08	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		5	213731	11/12/14 19:04	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212865	11/07/14 22:01	VAJ	TAL BUF

Client Sample ID: OC GW 24

Lab Sample ID: 480-70792-2

Date Collected: 11/04/14 13:03

Matrix: Water

Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 21:55	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 20:19	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		50	213731	11/12/14 19:04	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212865	11/07/14 22:00	VAJ	TAL BUF

Client Sample ID: OC GW 34D

Lab Sample ID: 480-70792-3

Date Collected: 11/03/14 12:00

Matrix: Water

Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 21:58	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 20:29	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214767	11/18/14 12:00	KMF	TAL BUF
Total/NA	Analysis	350.1		1	214913	11/19/14 12:09	KMF	TAL BUF
Total/NA	Prep	Distill/Ammonia			216644	12/01/14 22:42	RS	TAL BUF
Total/NA	Analysis	350.1		1	216655	12/02/14 00:32	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	212865	11/07/14 21:58	VAJ	TAL BUF

Client Sample ID: OC GW DUP 1

Lab Sample ID: 480-70792-4

Date Collected: 11/03/14 12:00

Matrix: Water

Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:12	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 21:08	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214119	11/13/14 17:00	KMF	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC GW DUP 1

Lab Sample ID: 480-70792-4

Date Collected: 11/03/14 12:00
Matrix: Water
Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	350.1		100	214151	11/14/14 11:14	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:35	VAJ	TAL BUF

Client Sample ID: OC GW 34SR

Lab Sample ID: 480-70792-5

Date Collected: 11/03/14 10:25
Matrix: Ground Water
Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:23	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 21:38	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214119	11/13/14 17:00	KMF	TAL BUF
Total/NA	Analysis	350.1		1	214151	11/14/14 11:15	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:36	VAJ	TAL BUF

Client Sample ID: OC MP2 PORT 13

Lab Sample ID: 480-70792-6

Date Collected: 11/03/14 09:40
Matrix: Water
Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:26	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 21:48	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214119	11/13/14 17:00	KMF	TAL BUF
Total/NA	Analysis	350.1		1	214151	11/14/14 11:16	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:38	VAJ	TAL BUF

Client Sample ID: OC GW 76S

Lab Sample ID: 480-70792-7

Date Collected: 11/04/14 10:08
Matrix: Water
Date Received: 11/06/14 06:18

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:29	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 21:58	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214119	11/13/14 17:00	KMF	TAL BUF
Total/NA	Analysis	350.1		10	214151	11/14/14 11:39	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:39	VAJ	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Client Sample ID: OC GW 43SR
Date Collected: 11/03/14 10:25
Date Received: 11/06/14 06:18

Lab Sample ID: 480-70792-8
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212453	11/07/14 08:15	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:32	LMH	TAL BUF
Total/NA	Analysis	300.0		1	214497	11/17/14 22:09	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214119	11/13/14 17:00	KMF	TAL BUF
Total/NA	Analysis	350.1		2	214151	11/14/14 11:40	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	212869	11/07/14 22:41	VAJ	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Aluminum
6010	3005A	Ground Water	Chromium
6010	3005A	Water	Aluminum
6010	3005A	Water	Chromium
SM 2510B		Ground Water	Specific Conductance
SM 2510B		Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-70792-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70792-1	OC GW 10S	Ground Water	11/04/14 11:55	11/06/14 06:18
480-70792-2	OC GW 24	Water	11/04/14 13:03	11/06/14 06:18
480-70792-3	OC GW 34D	Water	11/03/14 12:00	11/06/14 06:18
480-70792-4	OC GW DUP 1	Water	11/03/14 12:00	11/06/14 06:18
480-70792-5	OC GW 34SR	Ground Water	11/03/14 10:25	11/06/14 06:18
480-70792-6	OC MP2 PORT 13	Water	11/03/14 09:40	11/06/14 06:18
480-70792-7	OC GW 76S	Water	11/04/14 10:08	11/06/14 06:18
480-70792-8	OC GW 43SR	Ground Water	11/03/14 10:25	11/06/14 06:18

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70792-1

Login Number: 70792

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	Refer to job narrative for details
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp.
Samples received within 48 hours of sampling.	False	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Shawna IACOZZI Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56529-8585.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 2
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annau	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate

480-70792 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total No	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC GW 10S	11-4-14	11:55	G	W	✓		x	x	x	x	4	
OC GW 24	11-4-14	13:03	G	W	✓		x	x	x	x	4	
OC GW 34D	11-3-14	12:00	G	W	✓		x	x	x	x	4	
OC GW 34D MS	11-3-14	12:00	G	W	✓	✓	x	x	x	x	4	
OC GW 34D MSD	11-3-14	12:00	G	W	✓	✓	x	x	x	x	4	
OC GW Dup 1	11-3-14	12:00	G	W	✓	✓	x	x	x	x	4	
OC GW 34SR	11-3-14	10:25	G	W	✓		x	x	x	x	4	
OC MP2 Port 13	11-3-14	9:40	G	W	✓		x	x	x	x	4	
OC GW 76S	11-4-14	10:08	G	W	✓		x	x	x	x	4	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 11-5-14 13:20	Company	Received by: [signature]	Date/Time: 11-5-14 1320	Company
Relinquished by: [signature]	Date/Time: 11-5-14 1630	Company	Received by: [signature]	Date/Time: 11/06/14 0200	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.2 #1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-71175-1
Client Project/Site: Olin Chemical Groundwater

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/3/2014 1:57:51 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Job ID: 480-71175-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 11/12/2014 1:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

HPLC/IC
Method 300.0: Due to the high concentration of chloride, the matrix spike / matrix spike duplicate (MS/MSD) for batch 215299 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method 300.0, SM 4110B: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW201S (480-71175-3), SL3 (480-71174-1), SL3 (480-71174-1 MS), SL3 (480-71174-1 MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 6010: The continuing calibration verification (CCV 480-215954/25) recovered above the upper control limit for dissolved aluminum. Samples (MB 480-215019/1-A), OC-GW35S (480-71175-1), OC-GWCA1 (480-71175-2) associated with this CCV were below the standard reporting limit for the affected analytes; therefore, the data have been reported. The following samples are impacted: (MB 480-215019/1-A), OC-GW35S (480-71175-1), OC-GWCA1 (480-71175-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-71145-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-71145-1[1-3]

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

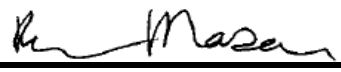
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[ ] Yes [X] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Project Manager

Printed Name: Becky Mason Date: 12/3/14 13:56

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Client Sample ID: OC-GW35S — Lab Sample ID: 480-71175-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	49		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	84	J ^	200	60	ug/L	1		6010	Dissolved
Chloride	3.8	J	5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	120		20	3.5	mg/L	10		300.0	Total/NA
Ammonia	11		2.0	1.0	mg/L	10		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	560		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GWCA1 — Lab Sample ID: 480-71175-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	17		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	13		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	86		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	3.4		1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	550		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW201S — Lab Sample ID: 480-71175-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	28		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	60	J	200	60	ug/L	1		6010	Dissolved
Chloride	94		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	1500		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	150		20	10	mg/L	100		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	3000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW35S

Lab Sample ID: 480-71175-1

Date Collected: 11/06/14 12:59

Matrix: Ground Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	49		5.0	1.0	ug/L		11/20/14 10:30	11/21/14 16:09	1
Aluminum	84	J ^	200	60	ug/L		11/20/14 10:30	11/21/14 16:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.8	J	5.0	2.8	mg/L			11/21/14 23:20	10
Sulfate	120		20	3.5	mg/L			11/21/14 23:20	10
Ammonia	11		2.0	1.0	mg/L		11/17/14 21:09	11/19/14 12:00	10

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	560		1.0	1.0	umhos/cm			11/13/14 01:01	1

Client Sample ID: OC-GWCA1

Lab Sample ID: 480-71175-2

Date Collected: 11/06/14 11:45

Matrix: Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	17		5.0	1.0	ug/L		11/20/14 10:30	11/21/14 16:12	1
Aluminum	ND	^	200	60	ug/L		11/20/14 10:30	11/21/14 16:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		0.50	0.28	mg/L			11/22/14 00:20	1
Sulfate	86		2.0	0.35	mg/L			11/22/14 00:20	1
Ammonia	3.4		1.0	0.50	mg/L		11/17/14 21:09	11/19/14 12:01	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	550		1.0	1.0	umhos/cm			11/13/14 01:04	1

Client Sample ID: OC-GW201S

Lab Sample ID: 480-71175-3

Date Collected: 11/11/14 09:30

Matrix: Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	28		5.0	1.0	ug/L		11/20/14 10:30	11/21/14 16:14	1
Aluminum	60	J	200	60	ug/L		11/20/14 10:30	11/22/14 10:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	94		0.50	0.28	mg/L			11/22/14 00:31	1
Sulfate	1500		40	7.0	mg/L			11/26/14 20:04	20
Ammonia	150		20	10	mg/L		11/17/14 21:09	11/19/14 12:22	100

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	3000		1.0	1.0	umhos/cm			11/13/14 01:05	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-215019/1-A
Matrix: Water
Analysis Batch: 215954

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 215019

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/20/14 10:30	11/21/14 15:55	1
Aluminum	ND	^	200	60	ug/L		11/20/14 10:30	11/21/14 15:55	1

Lab Sample ID: LCS 480-215019/2-A
Matrix: Water
Analysis Batch: 215954

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 215019

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	202		ug/L		101	80 - 120

Lab Sample ID: LCS 480-215019/2-A
Matrix: Water
Analysis Batch: 215565

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 215019

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	10000	11100		ug/L		111	80 - 120

Lab Sample ID: LCSD 480-215019/3-A
Matrix: Water
Analysis Batch: 215954

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 215019

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	199		ug/L		100	80 - 120	1	20

Lab Sample ID: LCSD 480-215019/3-A
Matrix: Water
Analysis Batch: 215565

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 215019

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	10000	11000		ug/L		110	80 - 120	1	20

Lab Sample ID: 480-71175-3 MS
Matrix: Water
Analysis Batch: 215954

Client Sample ID: OC-GW201S
Prep Type: Dissolved
Prep Batch: 215019

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	28		200	229		ug/L		100	75 - 125

Lab Sample ID: 480-71175-3 MS
Matrix: Water
Analysis Batch: 215565

Client Sample ID: OC-GW201S
Prep Type: Dissolved
Prep Batch: 215019

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	60	J	10000	11100		ug/L		110	75 - 125

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 480-71175-3 MSD — **Client Sample ID: OC-GW201S**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 215954 — **Prep Batch: 215019**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	28		200	226		ug/L		99	75 - 125	1	20

Lab Sample ID: 480-71175-3 MSD — **Client Sample ID: OC-GW201S**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 215565 — **Prep Batch: 215019**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	60	J	10000	11300		ug/L		113	75 - 125	2	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-215283/32 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215283

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/21/14 19:26	1
Sulfate	ND		2.0	0.35	mg/L			11/21/14 19:26	1

Lab Sample ID: LCS 480-215283/31 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215283

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.2		mg/L		96	83 - 121
Sulfate	20.0	19.7		mg/L		98	80 - 129

Lab Sample ID: 480-71175-1 MS — **Client Sample ID: OC-GW35S**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 215283

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.8	J	250	250		mg/L		99	83 - 121
Sulfate	120		250	366		mg/L		99	80 - 129

Lab Sample ID: MB 480-215299/60 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/22/14 00:10	1
Sulfate	ND		2.0	0.35	mg/L			11/22/14 00:10	1

Lab Sample ID: LCS 480-215299/59 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.3		mg/L		97	83 - 121

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-215299/59
Matrix: Water
Analysis Batch: 215299

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			20.0	19.9		mg/L		99	80 - 129		

Lab Sample ID: 480-71175-3 MS
Matrix: Water
Analysis Batch: 215299

Client Sample ID: OC-GW201S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	94		25.0	116	E	mg/L		88	83 - 121		

Lab Sample ID: MB 480-216163/4
Matrix: Water
Analysis Batch: 216163

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/26/14 16:11	1
Sulfate	ND		2.0	0.35	mg/L			11/26/14 16:11	1

Lab Sample ID: LCS 480-216163/3
Matrix: Water
Analysis Batch: 216163

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.2		mg/L		101	83 - 121		
Sulfate			20.0	20.0		mg/L		100	80 - 129		

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-214570/2-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214570

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/17/14 21:09	11/19/14 09:59	1

Lab Sample ID: LCS 480-214570/1-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 214570

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia			1.00	1.06		mg/L		106	90 - 110		

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-213764/1
Matrix: Water
Analysis Batch: 213764

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Specific Conductance			999	983		umhos/cm		98	90 - 110		

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: 480-71175-1 DU
Matrix: Ground Water
Analysis Batch: 213764

Client Sample ID: OC-GW35S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	560			552		umhos/cm				1	20

Metals

Prep Batch: 215019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Dissolved	Ground Water	3005A	
480-71175-2	OC-GWCA1	Dissolved	Water	3005A	
480-71175-3	OC-GW201S	Dissolved	Water	3005A	
480-71175-3 MS	OC-GW201S	Dissolved	Water	3005A	
480-71175-3 MSD	OC-GW201S	Dissolved	Water	3005A	
LCS 480-215019/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-215019/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-215019/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 215565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-3	OC-GW201S	Dissolved	Water	6010	215019
480-71175-3 MS	OC-GW201S	Dissolved	Water	6010	215019
480-71175-3 MSD	OC-GW201S	Dissolved	Water	6010	215019
LCS 480-215019/2-A	Lab Control Sample	Total Recoverable	Water	6010	215019
LCSD 480-215019/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	215019

Analysis Batch: 215954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Dissolved	Ground Water	6010	215019
480-71175-2	OC-GWCA1	Dissolved	Water	6010	215019
480-71175-3	OC-GW201S	Dissolved	Water	6010	215019
480-71175-3 MS	OC-GW201S	Dissolved	Water	6010	215019
480-71175-3 MSD	OC-GW201S	Dissolved	Water	6010	215019
LCS 480-215019/2-A	Lab Control Sample	Total Recoverable	Water	6010	215019
LCSD 480-215019/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	215019
MB 480-215019/1-A	Method Blank	Total Recoverable	Water	6010	215019

General Chemistry

Analysis Batch: 213764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Total/NA	Ground Water	SM 2510B	
480-71175-1 DU	OC-GW35S	Total/NA	Ground Water	SM 2510B	
480-71175-2	OC-GWCA1	Total/NA	Water	SM 2510B	
480-71175-3	OC-GW201S	Total/NA	Water	SM 2510B	
LCS 480-213764/1	Lab Control Sample	Total/NA	Water	SM 2510B	

Prep Batch: 214570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Total/NA	Ground Water	Distill/Ammonia	
480-71175-2	OC-GWCA1	Total/NA	Water	Distill/Ammonia	
480-71175-3	OC-GW201S	Total/NA	Water	Distill/Ammonia	
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214570/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 214913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Total/NA	Ground Water	350.1	214570
480-71175-2	OC-GWCA1	Total/NA	Water	350.1	214570

General Chemistry (Continued)

Analysis Batch: 214913 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-3	OC-GW201S	Total/NA	Water	350.1	214570
LCS 480-214570/1-A	Lab Control Sample	Total/NA	Water	350.1	214570
MB 480-214570/2-A	Method Blank	Total/NA	Water	350.1	214570

Analysis Batch: 215283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-1	OC-GW35S	Total/NA	Ground Water	300.0	
480-71175-1 MS	OC-GW35S	Total/NA	Ground Water	300.0	
LCS 480-215283/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215283/32	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 215299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-2	OC-GWCA1	Total/NA	Water	300.0	
480-71175-3	OC-GW201S	Total/NA	Water	300.0	
480-71175-3 MS	OC-GW201S	Total/NA	Water	300.0	
LCS 480-215299/59	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215299/60	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 216163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71175-3	OC-GW201S	Total/NA	Water	300.0	
LCS 480-216163/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-216163/4	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Client Sample ID: OC-GW35S

Lab Sample ID: 480-71175-1

Date Collected: 11/06/14 12:59

Matrix: Ground Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			215019	11/20/14 10:30	KJ1	TAL BUF
Dissolved	Analysis	6010		1	215954	11/21/14 16:09	LMH	TAL BUF
Total/NA	Analysis	300.0		10	215283	11/21/14 23:20	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214570	11/17/14 21:09	RS	TAL BUF
Total/NA	Analysis	350.1		10	214913	11/19/14 12:00	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213764	11/13/14 01:01	VAJ	TAL BUF

Client Sample ID: OC-GWCA1

Lab Sample ID: 480-71175-2

Date Collected: 11/06/14 11:45

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			215019	11/20/14 10:30	KJ1	TAL BUF
Dissolved	Analysis	6010		1	215954	11/21/14 16:12	LMH	TAL BUF
Total/NA	Analysis	300.0		1	215299	11/22/14 00:20	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214570	11/17/14 21:09	RS	TAL BUF
Total/NA	Analysis	350.1		5	214913	11/19/14 12:01	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213764	11/13/14 01:04	VAJ	TAL BUF

Client Sample ID: OC-GW201S

Lab Sample ID: 480-71175-3

Date Collected: 11/11/14 09:30

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			215019	11/20/14 10:30	KJ1	TAL BUF
Dissolved	Analysis	6010		1	215954	11/21/14 16:14	LMH	TAL BUF
Dissolved	Prep	3005A			215019	11/20/14 10:30	KJ1	TAL BUF
Dissolved	Analysis	6010		1	215565	11/22/14 10:53	LMH	TAL BUF
Total/NA	Analysis	300.0		1	215299	11/22/14 00:31	NDB	TAL BUF
Total/NA	Analysis	300.0		20	216163	11/26/14 20:04	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214570	11/17/14 21:09	RS	TAL BUF
Total/NA	Analysis	350.1		100	214913	11/19/14 12:22	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213764	11/13/14 01:05	VAJ	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Aluminum
6010	3005A	Ground Water	Chromium
6010	3005A	Water	Aluminum
6010	3005A	Water	Chromium
SM 2510B		Ground Water	Specific Conductance
SM 2510B		Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 480-71175-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-71175-1	OC-GW35S	Ground Water	11/06/14 12:59	11/12/14 01:00
480-71175-2	OC-GWCA1	Water	11/06/14 11:45	11/12/14 01:00
480-71175-3	OC-GW201S	Water	11/11/14 09:30	11/12/14 01:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-71175-1

Login Number: 71175

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OLIN CORP.
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	True	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Shauna Iacozzi / Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56529-8585.2
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 2 of 2
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:	Analysis Requested		
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater SemiAnnual Event Desc: Groundwater Semi-annu	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Chloride/Sulfate	350.1 - Ammonia	6010MCP - Al/Cr Dissolved Field filtered	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N		
OC GW35S	11-6-14	12:59	G		✓		✓	✓	✓	✓	4	
OC GW CA1	11-6-14	11:45	G		✓		✓	✓	✓	✓	4	
OC GW201S	11-11-14	9:30	G		✓		✓	✓	✓	✓	4	

480-71175 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Brian Guichard	11-11-14 14:00			11/11/14 14:00	TA
2		11/11/14 16:00	TA		11/12/14 0100	TA
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.6 #1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-71471-1
Client Project/Site: Olin Chemical Quarterly Groundwater

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/5/2014 1:20:10 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-71471-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt

The samples were received on 11/15/2014 2:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

HPLC/IC

Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: (480-71101-11 MS), (480-71405-2 MS), Broadstone-Groton-Kitchen (480-71405-2), Cell 10 Primary (480-71101-11), OC-PZ-24 (480-71471-1), OC-PZ-25 (480-71471-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 6010: The continuing calibration verification (CCV) associated with batch 480-214898/46 recovered above the upper control limit for Dissolved Aluminum. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: OC-PZ-24 (480-71471-1), OC-PZ-25 (480-71471-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-71471-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-71471-1[1-2]

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Project Manager

Printed Name: Becky Mason Date: 12/5/14 13:18

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

Client Sample ID: OC-PZ-24 — Lab Sample ID: 480-71471-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	31		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	16		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	700		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	43	B	5.0	2.5	mg/L	25		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1700		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-25 — Lab Sample ID: 480-71471-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	11		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	23		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	490		10	1.7	mg/L	5		300.0	Total/NA
Ammonia	49	B	5.0	2.5	mg/L	25		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-PZ-24

Lab Sample ID: 480-71471-1

Date Collected: 11/14/14 08:15

Matrix: Ground Water

Date Received: 11/15/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	31		5.0	1.0	ug/L		11/17/14 07:50	11/18/14 20:58	1
Aluminum	ND	^	200	60	ug/L		11/17/14 07:50	11/18/14 20:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16		0.50	0.28	mg/L			11/25/14 02:51	1
Sulfate	700		40	7.0	mg/L			11/25/14 19:09	20
Ammonia	43	B	5.0	2.5	mg/L		12/01/14 21:30	12/02/14 00:25	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1700		1.0	1.0	umhos/cm			11/18/14 00:51	1

Client Sample ID: OC-PZ-25

Lab Sample ID: 480-71471-2

Date Collected: 11/14/14 08:50

Matrix: Ground Water

Date Received: 11/15/14 02:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	11		5.0	1.0	ug/L		11/17/14 07:50	11/18/14 21:01	1
Aluminum	ND	^	200	60	ug/L		11/17/14 07:50	11/18/14 21:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23		0.50	0.28	mg/L			11/25/14 03:01	1
Sulfate	490		10	1.7	mg/L			11/25/14 19:19	5
Ammonia	49	B	5.0	2.5	mg/L		12/01/14 21:30	12/02/14 00:25	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1300		1.0	1.0	umhos/cm			11/18/14 00:52	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-214379/1-A
Matrix: Water
Analysis Batch: 214898

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/17/14 07:50	11/18/14 19:27	1

Lab Sample ID: MB 480-214379/1-A
Matrix: Water
Analysis Batch: 215106

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		200	60	ug/L		11/17/14 07:50	11/19/14 18:32	1

Lab Sample ID: LCS 480-214379/2-A
Matrix: Water
Analysis Batch: 214898

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	209		ug/L		104	80 - 120

Lab Sample ID: LCS 480-214379/2-A
Matrix: Water
Analysis Batch: 215106

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	10000	10400		ug/L		104	80 - 120

Lab Sample ID: LCSD 480-214379/3-A
Matrix: Water
Analysis Batch: 214898

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	212		ug/L		106	80 - 120	2	20

Lab Sample ID: LCSD 480-214379/3-A
Matrix: Water
Analysis Batch: 215106

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 214379

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	10000	10300		ug/L		103	80 - 120	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-215659/32
Matrix: Water
Analysis Batch: 215659

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/25/14 02:31	1
Sulfate	ND		2.0	0.35	mg/L			11/25/14 02:31	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-215659/31
Matrix: Water
Analysis Batch: 215659

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.6		mg/L		98	83 - 121
Sulfate	20.0	20.1		mg/L		101	80 - 129

Lab Sample ID: MB 480-215961/4
Matrix: Water
Analysis Batch: 215961

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/25/14 18:08	1
Sulfate	ND		2.0	0.35	mg/L			11/25/14 18:08	1

Lab Sample ID: LCS 480-215961/3
Matrix: Water
Analysis Batch: 215961

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.1		mg/L		101	83 - 121
Sulfate	20.0	20.0		mg/L		100	80 - 129

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-216634/2-A
Matrix: Water
Analysis Batch: 216655

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 216634

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.130	J	0.20	0.10	mg/L		12/01/14 21:30	12/01/14 23:46	1

Lab Sample ID: LCS 480-216634/1-A
Matrix: Water
Analysis Batch: 216655

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 216634

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.10		mg/L		110	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-214591/1
Matrix: Water
Analysis Batch: 214591

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	1020		umhos/cm		102	90 - 110

Metals

Prep Batch: 214379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Dissolved	Ground Water	3005A	
480-71471-2	OC-PZ-25	Dissolved	Ground Water	3005A	
LCS 480-214379/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-214379/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-214379/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 214898

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Dissolved	Ground Water	6010	214379
480-71471-2	OC-PZ-25	Dissolved	Ground Water	6010	214379
LCS 480-214379/2-A	Lab Control Sample	Total Recoverable	Water	6010	214379
LCSD 480-214379/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	214379
MB 480-214379/1-A	Method Blank	Total Recoverable	Water	6010	214379

Analysis Batch: 215106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-214379/2-A	Lab Control Sample	Total Recoverable	Water	6010	214379
LCSD 480-214379/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	214379
MB 480-214379/1-A	Method Blank	Total Recoverable	Water	6010	214379

General Chemistry

Analysis Batch: 214591

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Total/NA	Ground Water	SM 2510B	
480-71471-2	OC-PZ-25	Total/NA	Ground Water	SM 2510B	
LCS 480-214591/1	Lab Control Sample	Total/NA	Water	SM 2510B	

Analysis Batch: 215659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Total/NA	Ground Water	300.0	
480-71471-2	OC-PZ-25	Total/NA	Ground Water	300.0	
LCS 480-215659/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215659/32	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 215961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Total/NA	Ground Water	300.0	
480-71471-2	OC-PZ-25	Total/NA	Ground Water	300.0	
LCS 480-215961/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215961/4	Method Blank	Total/NA	Water	300.0	

Prep Batch: 216634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Total/NA	Ground Water	Distill/Ammonia	
480-71471-2	OC-PZ-25	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-216634/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-216634/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

General Chemistry (Continued)

Analysis Batch: 216655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71471-1	OC-PZ-24	Total/NA	Ground Water	350.1	216634
480-71471-2	OC-PZ-25	Total/NA	Ground Water	350.1	216634
LCS 480-216634/1-A	Lab Control Sample	Total/NA	Water	350.1	216634
MB 480-216634/2-A	Method Blank	Total/NA	Water	350.1	216634

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

Client Sample ID: OC-PZ-24

Lab Sample ID: 480-71471-1

Date Collected: 11/14/14 08:15

Matrix: Ground Water

Date Received: 11/15/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			214379	11/17/14 07:50	KJ1	TAL BUF
Dissolved	Analysis	6010		1	214898	11/18/14 20:58	TRB	TAL BUF
Total/NA	Analysis	300.0		1	215659	11/25/14 02:51	NDB	TAL BUF
Total/NA	Analysis	300.0		20	215961	11/25/14 19:09	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			216634	12/01/14 21:30	RS	TAL BUF
Total/NA	Analysis	350.1		25	216655	12/02/14 00:25	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	214591	11/18/14 00:51	VAJ	TAL BUF

Client Sample ID: OC-PZ-25

Lab Sample ID: 480-71471-2

Date Collected: 11/14/14 08:50

Matrix: Ground Water

Date Received: 11/15/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			214379	11/17/14 07:50	KJ1	TAL BUF
Dissolved	Analysis	6010		1	214898	11/18/14 21:01	TRB	TAL BUF
Total/NA	Analysis	300.0		1	215659	11/25/14 03:01	NDB	TAL BUF
Total/NA	Analysis	300.0		5	215961	11/25/14 19:19	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			216634	12/01/14 21:30	RS	TAL BUF
Total/NA	Analysis	350.1		25	216655	12/02/14 00:25	RS	TAL BUF
Total/NA	Analysis	SM 2510B		1	214591	11/18/14 00:52	VAJ	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Aluminum
6010	3005A	Ground Water	Chromium
SM 2510B		Ground Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 480-71471-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-71471-1	OC-PZ-24	Ground Water	11/14/14 08:15	11/15/14 02:00
480-71471-2	OC-PZ-25	Ground Water	11/14/14 08:50	11/15/14 02:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-71471-1

Login Number: 71471

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-58474-15336.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:

Address: PO BOX 248	Due Date Requested:
City: Charleston	TAT Requested (days):
State, Zip: TN, 37310-0248	
Phone: 423-336-4012(Tel)	PO #: REWI0020
Email: jmcashwell@olin.com	WO #:
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (Marc	Project #: 48006612
Site: Massachusetts	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Dissolved Al/Cr	2510B - Specific Conductance	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	S	D	N		
OC-PZ-24	11-14-14	8:15	G	Water	✓		✓	✓	✓	✓	4	
OC-PZ-25	11-14-14	8:50	G	Water	✓		✓	✓	✓	✓	4	
OC-				Water								

480-71471 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by: Brian Guichard	Date/Time:	Company	Received by:	Date/Time: 11/14/14 14:30	Company TA
	Relinquished by:	Date/Time: 11/14/14 16:30	Company TA	Received by:	Date/Time: 11/15/14 0200	Company TA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.4 #1

Page 17 of 17

12/5/2014

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-70932-1
Client Project/Site: Olin Chemical Surfacewater Quarterly
Sampling Event: Surfacewater Quarterly (May/November)

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/24/2014 11:34:01 AM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery exceeds the control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-70932-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt

The samples were received on 11/7/2014 at 1:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2º C.

HPLC/IC

Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: (480-70932-1 MS), OC-ISCO1 (480-70932-1), OC-DUP SW PZ18RSW (480-70932-8), OC-ISCO2 (480-70932-2), OC-ISCO3 (480-70932-3), OC-PZ-16RRSW (480-70932-4), OC-PZ-17RRSW (480-70932-5), OC-PZ-18RSW (480-70932-6), OC-PZ-18RSW (480-70932-6 MS), OC-PZ-18RSW (480-70932-6 MSD) and OC-SD-17 (480-70932-7). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 6010: The recovery of Post Spike (480-70932-6 PDS) in batch 480-212959 exhibited results outside the quality control limits for dissolved sodium, but the Serial Dilution of this sample was compliant, so no corrective action was necessary.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

Method 350.1: The method blank for batch 214913 contained ammonia above the method detection limit. This target analyte concentration was less than the reporting limit (RL), so re-extraction and/or re-analysis of the following samples was not performed: OC-DUP SW PZ18RSW (480-70932-8), OC-ISCO1 (480-70932-1), OC-ISCO2 (480-70932-2), OC-ISCO3 (480-70932-3), OC-PZ-16RRSW (480-70932-4), OC-PZ-17RRSW (480-70932-5) and OC-SD-17 (480-70932-7).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-70932-1**

Project Location: **Olin Chemical Surfacewater Quarterly** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-70932-1 [1-8]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ■ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 11/24/14 11:13

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Client Sample ID: OC-ISCO1 — Lab Sample ID: 480-70932-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	13		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	230		200	60	ug/L	1		6010	Total/NA
Sodium	94000		1000	320	ug/L	1		6010	Total/NA
Chromium	10		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	180	J	200	60	ug/L	1		6010	Dissolved
Sodium	91000		1000	320	ug/L	1		6010	Dissolved
Chloride	160		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	69		20	3.5	mg/L	10		300.0	Total/NA
Ammonia	15	B	2.0	1.0	mg/L	10		350.1	Total/NA
Nitrate as N	0.058		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	810		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO2 — Lab Sample ID: 480-70932-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	66		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	440		200	60	ug/L	1		6010	Total/NA
Sodium	120000		1000	320	ug/L	1		6010	Total/NA
Chromium	32		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	120	J	200	60	ug/L	1		6010	Dissolved
Sodium	120000		1000	320	ug/L	1		6010	Dissolved
Chloride	160		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	250		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	37	B	4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	1.4		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1200		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO3 — Lab Sample ID: 480-70932-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	100000		1000	320	ug/L	1		6010	Total/NA
Sodium	100000		1000	320	ug/L	1		6010	Dissolved
Chloride	210		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	24	J	40	7.0	mg/L	20		300.0	Total/NA
Ammonia	1.3	B	0.20	0.10	mg/L	1		350.1	Total/NA
Nitrate as N	0.68		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	890		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-16RRSW — Lab Sample ID: 480-70932-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	180		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	740		200	60	ug/L	1		6010	Total/NA
Sodium	130000		1000	320	ug/L	1		6010	Total/NA
Chromium	160		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	610		200	60	ug/L	1		6010	Dissolved
Sodium	130000		1000	320	ug/L	1		6010	Dissolved

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Client Sample ID: OC-PZ-16RRSW (Continued) — Lab Sample ID: 480-70932-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	180		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	250		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	40	B	4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.95		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17RRSW — Lab Sample ID: 480-70932-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	420		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	1900		200	60	ug/L	1		6010	Total/NA
Sodium	130000		1000	320	ug/L	1		6010	Total/NA
Chromium	200		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	460		200	60	ug/L	1		6010	Dissolved
Sodium	130000		1000	320	ug/L	1		6010	Dissolved
Chloride	180		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	240		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	39	B	4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.49		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18RSW — Lab Sample ID: 480-70932-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	13		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	210		200	60	ug/L	1		6010	Total/NA
Sodium	92000		1000	320	ug/L	1		6010	Total/NA
Chromium	10		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	150	J	200	60	ug/L	1		6010	Dissolved
Sodium	91000		1000	320	ug/L	1		6010	Dissolved
Chloride	160		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	69		20	3.5	mg/L	10		300.0	Total/NA
Ammonia	11		2.0	1.0	mg/L	10		350.1	Total/NA
Nitrate as N	0.047	J	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	790		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SD-17 — Lab Sample ID: 480-70932-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	720		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	3600		200	60	ug/L	1		6010	Total/NA
Sodium	130000		1000	320	ug/L	1		6010	Total/NA
Chromium	290		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	970		200	60	ug/L	1		6010	Dissolved
Sodium	130000		1000	320	ug/L	1		6010	Dissolved
Chloride	190		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	250		40	7.0	mg/L	20		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Client Sample ID: OC-SD-17 (Continued)

Lab Sample ID: 480-70932-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ammonia	44	B	8.0	4.0	mg/L	40		350.1	Total/NA
Nitrate as N	0.54		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-DUP SW PZ18RSW

Lab Sample ID: 480-70932-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	13		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	250		200	60	ug/L	1		6010	Total/NA
Sodium	93000		1000	320	ug/L	1		6010	Total/NA
Chromium	10		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	180	J	200	60	ug/L	1		6010	Dissolved
Sodium	95000		1000	320	ug/L	1		6010	Dissolved
Chloride	160		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	69		20	3.5	mg/L	10		300.0	Total/NA
Ammonia	15	B	2.0	1.0	mg/L	10		350.1	Total/NA
Nitrate as N	0.048	J	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	780		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-ISCO1

Date Collected: 11/06/14 09:50
Date Received: 11/07/14 01:45

Lab Sample ID: 480-70932-1
Matrix: Surface Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	13		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:11	1
Aluminum	230		200	60	ug/L		11/10/14 09:56	11/12/14 18:11	1
Sodium	94000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:11	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	10		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:10	1
Aluminum	180	J	200	60	ug/L		11/10/14 08:15	11/13/14 02:10	1
Sodium	91000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		5.0	2.8	mg/L			11/18/14 13:04	10
Sulfate	69		20	3.5	mg/L			11/18/14 13:04	10
Ammonia	15	B	2.0	1.0	mg/L		11/14/14 16:17	11/19/14 11:37	10
Nitrate as N	0.058		0.050	0.020	mg/L			11/07/14 22:23	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:23	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	810		1.0	1.0	umhos/cm			11/10/14 21:33	1

Client Sample ID: OC-ISCO2

Date Collected: 11/06/14 08:25
Date Received: 11/07/14 01:45

Lab Sample ID: 480-70932-2
Matrix: Surface Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	66		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:14	1
Aluminum	440		200	60	ug/L		11/10/14 09:56	11/12/14 18:14	1
Sodium	120000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:14	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	32		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:13	1
Aluminum	120	J	200	60	ug/L		11/10/14 08:15	11/13/14 02:13	1
Sodium	120000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		10	5.6	mg/L			11/18/14 14:05	20
Sulfate	250		40	7.0	mg/L			11/18/14 14:05	20
Ammonia	37	B	4.0	2.0	mg/L		11/14/14 16:17	11/19/14 11:38	20
Nitrate as N	1.4		0.050	0.020	mg/L			11/07/14 22:24	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1200		1.0	1.0	umhos/cm			11/10/14 21:34	1

Client Sample ID: OC-ISCO3

Lab Sample ID: 480-70932-3

Date Collected: 11/06/14 08:10

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:16	1
Aluminum	ND		200	60	ug/L		11/10/14 09:56	11/12/14 18:16	1
Sodium	**100000**		1000	320	ug/L		11/10/14 09:56	11/12/14 18:16	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:15	1
Aluminum	ND		200	60	ug/L		11/10/14 08:15	11/13/14 02:15	1
Sodium	**100000**		1000	320	ug/L		11/10/14 08:15	11/13/14 02:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**		10	5.6	mg/L			11/18/14 14:15	20
Sulfate	**24**	**J**	40	7.0	mg/L			11/18/14 14:15	20
Ammonia	**1.3**	**B**	0.20	0.10	mg/L		11/14/14 16:17	11/19/14 10:07	1
Nitrate as N	**0.68**		0.050	0.020	mg/L			11/07/14 22:25	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	**890**		1.0	1.0	umhos/cm			11/10/14 21:37	1

Client Sample ID: OC-PZ-16RRSW

Lab Sample ID: 480-70932-4

Date Collected: 11/06/14 08:45

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**180**		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:19	1
Aluminum	**740**		200	60	ug/L		11/10/14 09:56	11/12/14 18:19	1
Sodium	**130000**		1000	320	ug/L		11/10/14 09:56	11/12/14 18:19	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**160**		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:18	1
Aluminum	**610**		200	60	ug/L		11/10/14 08:15	11/13/14 02:18	1
Sodium	**130000**		1000	320	ug/L		11/10/14 08:15	11/13/14 02:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**180**		10	5.6	mg/L			11/18/14 14:25	20
Sulfate	**250**		40	7.0	mg/L			11/18/14 14:25	20
Ammonia	**40**	**B**	4.0	2.0	mg/L		11/14/14 16:17	11/19/14 11:39	20
Nitrate as N	**0.95**		0.050	0.020	mg/L			11/07/14 20:32	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	**1300**		1.0	1.0	umhos/cm			11/10/14 21:39	1

Client Sample ID: OC-PZ-17RRSW

Lab Sample ID: 480-70932-5

Date Collected: 11/06/14 09:00

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	420		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:22	1
Aluminum	1900		200	60	ug/L		11/10/14 09:56	11/12/14 18:22	1
Sodium	130000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:22	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	200		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:21	1
Aluminum	460		200	60	ug/L		11/10/14 08:15	11/13/14 02:21	1
Sodium	130000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		10	5.6	mg/L			11/18/14 14:35	20
Sulfate	240		40	7.0	mg/L			11/18/14 14:35	20
Ammonia	39	B	4.0	2.0	mg/L		11/14/14 16:17	11/19/14 11:41	20
Nitrate as N	0.49		0.050	0.020	mg/L			11/07/14 20:33	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:33	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1300		1.0	1.0	umhos/cm			11/10/14 21:40	1

Client Sample ID: OC-PZ-18RSW

Lab Sample ID: 480-70932-6

Date Collected: 11/06/14 09:35

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	13		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:24	1
Aluminum	210		200	60	ug/L		11/10/14 09:56	11/12/14 18:24	1
Sodium	92000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:24	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	10		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:23	1
Aluminum	150	J	200	60	ug/L		11/10/14 08:15	11/13/14 02:23	1
Sodium	91000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		5.0	2.8	mg/L			11/18/14 14:46	10
Sulfate	69		20	3.5	mg/L			11/18/14 14:46	10
Ammonia	11		2.0	1.0	mg/L		11/18/14 15:20	11/19/14 12:15	10
Nitrate as N	0.047	J	0.050	0.020	mg/L			11/07/14 22:28	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	790		1.0	1.0	umhos/cm			11/10/14 21:41	1

Client Sample ID: OC-SD-17

Lab Sample ID: 480-70932-7

Date Collected: 11/06/14 09:20

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	720		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:45	1
Aluminum	3600		200	60	ug/L		11/10/14 09:56	11/12/14 18:45	1
Sodium	130000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:45	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	290		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:44	1
Aluminum	970		200	60	ug/L		11/10/14 08:15	11/13/14 02:44	1
Sodium	130000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	190		10	5.6	mg/L			11/18/14 15:16	20
Sulfate	250		40	7.0	mg/L			11/18/14 15:16	20
Ammonia	44	B	8.0	4.0	mg/L		11/14/14 16:17	11/19/14 12:21	40
Nitrate as N	0.54		0.050	0.020	mg/L			11/07/14 20:34	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1300		1.0	1.0	umhos/cm			11/10/14 21:43	1

Client Sample ID: OC-DUP SW PZ18RSW

Lab Sample ID: 480-70932-8

Date Collected: 11/06/14 09:35

Matrix: Surface Water

Date Received: 11/07/14 01:45

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	13		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 18:48	1
Aluminum	250		200	60	ug/L		11/10/14 09:56	11/12/14 18:48	1
Sodium	93000		1000	320	ug/L		11/10/14 09:56	11/12/14 18:48	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	10		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 02:47	1
Aluminum	180	J	200	60	ug/L		11/10/14 08:15	11/13/14 02:47	1
Sodium	95000		1000	320	ug/L		11/10/14 08:15	11/13/14 02:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		5.0	2.8	mg/L			11/18/14 15:26	10
Sulfate	69		20	3.5	mg/L			11/18/14 15:26	10
Ammonia	15	B	2.0	1.0	mg/L		11/14/14 16:17	11/19/14 11:44	10
Nitrate as N	0.048	J	0.050	0.020	mg/L			11/07/14 20:09	1
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 20:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	780		1.0	1.0	umhos/cm			11/10/14 21:44	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-212924/1-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 212924

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/10/14 09:56	11/12/14 17:55	1
Aluminum	ND		200	60	ug/L		11/10/14 09:56	11/12/14 17:55	1
Sodium	ND		1000	320	ug/L		11/10/14 09:56	11/12/14 17:55	1

Lab Sample ID: LCS 480-212924/2-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 212924

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	201	199		ug/L		99	80 - 120
Aluminum	10000	9800		ug/L		98	80 - 120
Sodium	10000	9710		ug/L		97	80 - 120

Lab Sample ID: LCSD 480-212924/3-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 212924

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	201	205		ug/L		102	80 - 120	3	20
Aluminum	10000	10400		ug/L		104	80 - 120	6	20
Sodium	10000	10300		ug/L		103	80 - 120	6	20

Lab Sample ID: 480-70932-6 MS
Matrix: Surface Water
Analysis Batch: 213792

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA
Prep Batch: 212924

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	13		201	213		ug/L		100	75 - 125
Aluminum	210		10000	10300		ug/L		101	75 - 125
Sodium	92000		10000	102000	4	ug/L		96	75 - 125

Lab Sample ID: 480-70932-6 MSD
Matrix: Surface Water
Analysis Batch: 213792

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA
Prep Batch: 212924

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	13		201	214		ug/L		100	75 - 125	0	20
Aluminum	210		10000	10200		ug/L		100	75 - 125	0	20
Sodium	92000		10000	102000	4	ug/L		93	75 - 125	0	20

Lab Sample ID: MB 480-212959/1-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 212959

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/10/14 08:15	11/13/14 01:54	1
Aluminum	ND		200	60	ug/L		11/10/14 08:15	11/13/14 01:54	1
Sodium	ND		1000	320	ug/L		11/10/14 08:15	11/13/14 01:54	1

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: LCS 480-212959/2-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 212959

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	201	198		ug/L		99	80 - 120
Aluminum	10000	9930		ug/L		99	80 - 120
Sodium	10000	9860		ug/L		98	80 - 120

Lab Sample ID: LCSD 480-212959/3-A
Matrix: Water
Analysis Batch: 213792

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 212959

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	201	199		ug/L		99	80 - 120	0	20
Aluminum	10000	9710		ug/L		97	80 - 120	2	20
Sodium	10000	9680		ug/L		97	80 - 120	2	20

Lab Sample ID: 480-70932-6 MS
Matrix: Surface Water
Analysis Batch: 213792

Client Sample ID: OC-PZ-18RSW
Prep Type: Dissolved
Prep Batch: 212959

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	10		201	211		ug/L		100	75 - 125
Aluminum	150	J	10000	10200		ug/L		100	75 - 125
Sodium	91000		10000	102000	4	ug/L		112	75 - 125

Lab Sample ID: 480-70932-6 MSD
Matrix: Surface Water
Analysis Batch: 213792

Client Sample ID: OC-PZ-18RSW
Prep Type: Dissolved
Prep Batch: 212959

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	10		201	214		ug/L		102	75 - 125	1	20
Aluminum	150	J	10000	10300		ug/L		101	75 - 125	1	20
Sodium	91000		10000	103000	4	ug/L		124	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-214540/4
Matrix: Water
Analysis Batch: 214540

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/18/14 09:11	1
Sulfate	ND		2.0	0.35	mg/L			11/18/14 09:11	1

Lab Sample ID: LCS 480-214540/3
Matrix: Water
Analysis Batch: 214540

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.8		mg/L		94	83 - 121
Sulfate	20.0	19.4		mg/L		97	80 - 129

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-70932-1 MS
Matrix: Surface Water
Analysis Batch: 214540

Client Sample ID: OC-ISCO1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	160		250	390		mg/L		93	83 - 121
Sulfate	69		250	302		mg/L		93	80 - 129

Lab Sample ID: MB 480-214542/32
Matrix: Water
Analysis Batch: 214542

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/18/14 13:55	1
Sulfate	ND		2.0	0.35	mg/L			11/18/14 13:55	1

Lab Sample ID: LCS 480-214542/31
Matrix: Water
Analysis Batch: 214542

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.8		mg/L		94	83 - 121
Sulfate	20.0	19.2		mg/L		96	80 - 129

Lab Sample ID: 480-70932-6 MS
Matrix: Surface Water
Analysis Batch: 214542

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	160		250	385		mg/L		91	83 - 121
Sulfate	69		250	300		mg/L		92	80 - 129

Lab Sample ID: 480-70932-6 MSD
Matrix: Surface Water
Analysis Batch: 214542

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	160		250	383		mg/L		90	83 - 121	1	20
Sulfate	69		250	298		mg/L		91	80 - 129	1	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-214545/2-A
Matrix: Water
Analysis Batch: 214913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 214545

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.137	J	0.20	0.10	mg/L		11/14/14 16:17	11/19/14 09:55	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 480-214545/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214545**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.06		mg/L		106	90 - 110

Lab Sample ID: 480-70932-3 MS — **Client Sample ID: OC-ISCO3**
Matrix: Surface Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214545**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.3	B	0.500	15.1	F1	mg/L		2760	90 - 110

Lab Sample ID: 480-70932-3 MSD — **Client Sample ID: OC-ISCO3**
Matrix: Surface Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214545**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	1.3	B	0.500	15.6	F1	mg/L		2860	90 - 110	3	20

Lab Sample ID: 480-70932-5 MS — **Client Sample ID: OC-PZ-17RRSW**
Matrix: Surface Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214545**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	39	B	0.500	39.6	4	mg/L		200	90 - 110

Lab Sample ID: 480-70932-4 DU — **Client Sample ID: OC-PZ-16RRSW**
Matrix: Surface Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214545**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Ammonia	40	B	41.2		mg/L		3	20

Lab Sample ID: MB 480-214770/2-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214770**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/18/14 15:20	11/19/14 10:02	1

Lab Sample ID: LCS 480-214770/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214770**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.997		mg/L		100	90 - 110

Lab Sample ID: 480-70932-6 MS — **Client Sample ID: OC-PZ-18RSW**
Matrix: Surface Water — **Prep Type: Total/NA**
Analysis Batch: 214913 — **Prep Batch: 214770**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	11		0.500	13.6	4	mg/L		480	90 - 110

Lab Sample ID: 480-70932-6 MSD
Matrix: Surface Water
Analysis Batch: 214913

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA
Prep Batch: 214770

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	11		0.500	16.7	4	mg/L		1100	90 - 110	20	20

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-212868/27
Matrix: Water
Analysis Batch: 212868

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.020	mg/L			11/07/14 22:15	1

Lab Sample ID: LCS 480-212868/28
Matrix: Water
Analysis Batch: 212868

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	1.50	1.57		mg/L		105	90 - 110

Lab Sample ID: 480-70932-6 MS
Matrix: Surface Water
Analysis Batch: 212868

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	ND		1.00	1.02		mg/L		102	90 - 110

Lab Sample ID: 480-70932-6 MSD
Matrix: Surface Water
Analysis Batch: 212868

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND		1.00	0.997		mg/L		100	90 - 110	2	20

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-213230/1
Matrix: Water
Analysis Batch: 213230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	994		umhos/cm		99	90 - 110

Lab Sample ID: LCS 480-213230/23
Matrix: Water
Analysis Batch: 213230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	999	1030		umhos/cm		103	90 - 110

Metals

Prep Batch: 212924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	3005A	
480-70932-2	OC-ISCO2	Total/NA	Surface Water	3005A	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	3005A	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	3005A	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	3005A	
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	3005A	
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	3005A	
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	3005A	
480-70932-7	OC-SD-17	Total/NA	Surface Water	3005A	
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	3005A	
LCS 480-212924/2-A	Lab Control Sample	Total/NA	Water	3005A	
LCSD 480-212924/3-A	Lab Control Sample Dup	Total/NA	Water	3005A	
MB 480-212924/1-A	Method Blank	Total/NA	Water	3005A	

Prep Batch: 212959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Dissolved	Surface Water	3005A	
480-70932-2	OC-ISCO2	Dissolved	Surface Water	3005A	
480-70932-3	OC-ISCO3	Dissolved	Surface Water	3005A	
480-70932-4	OC-PZ-16RRSW	Dissolved	Surface Water	3005A	
480-70932-5	OC-PZ-17RRSW	Dissolved	Surface Water	3005A	
480-70932-6	OC-PZ-18RSW	Dissolved	Surface Water	3005A	
480-70932-6 MS	OC-PZ-18RSW	Dissolved	Surface Water	3005A	
480-70932-6 MSD	OC-PZ-18RSW	Dissolved	Surface Water	3005A	
480-70932-7	OC-SD-17	Dissolved	Surface Water	3005A	
480-70932-8	OC-DUP SW PZ18RSW	Dissolved	Surface Water	3005A	
LCS 480-212959/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-212959/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-212959/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 213792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Dissolved	Surface Water	6010	212959
480-70932-1	OC-ISCO1	Total/NA	Surface Water	6010	212924
480-70932-2	OC-ISCO2	Dissolved	Surface Water	6010	212959
480-70932-2	OC-ISCO2	Total/NA	Surface Water	6010	212924
480-70932-3	OC-ISCO3	Dissolved	Surface Water	6010	212959
480-70932-3	OC-ISCO3	Total/NA	Surface Water	6010	212924
480-70932-4	OC-PZ-16RRSW	Dissolved	Surface Water	6010	212959
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	6010	212924
480-70932-5	OC-PZ-17RRSW	Dissolved	Surface Water	6010	212959
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	6010	212924
480-70932-6	OC-PZ-18RSW	Dissolved	Surface Water	6010	212959
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	6010	212924
480-70932-6 MS	OC-PZ-18RSW	Dissolved	Surface Water	6010	212959
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	6010	212924
480-70932-6 MSD	OC-PZ-18RSW	Dissolved	Surface Water	6010	212959
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	6010	212924
480-70932-7	OC-SD-17	Dissolved	Surface Water	6010	212959
480-70932-7	OC-SD-17	Total/NA	Surface Water	6010	212924
480-70932-8	OC-DUP SW PZ18RSW	Dissolved	Surface Water	6010	212959

Metals (Continued)

Analysis Batch: 213792 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	6010	212924
LCS 480-212924/2-A	Lab Control Sample	Total/NA	Water	6010	212924
LCS 480-212959/2-A	Lab Control Sample	Total Recoverable	Water	6010	212959
LCSD 480-212924/3-A	Lab Control Sample Dup	Total/NA	Water	6010	212924
LCSD 480-212959/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	212959
MB 480-212924/1-A	Method Blank	Total/NA	Water	6010	212924
MB 480-212959/1-A	Method Blank	Total Recoverable	Water	6010	212959

General Chemistry

Analysis Batch: 212868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	353.2	
480-70932-2	OC-ISCO2	Total/NA	Surface Water	353.2	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	353.2	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	353.2	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	353.2	
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-70932-7	OC-SD-17	Total/NA	Surface Water	353.2	
LCS 480-212868/28	Lab Control Sample	Total/NA	Water	353.2	
MB 480-212868/27	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 212871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	353.2	
480-70932-2	OC-ISCO2	Total/NA	Surface Water	353.2	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	353.2	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	353.2	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	353.2	
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-70932-7	OC-SD-17	Total/NA	Surface Water	353.2	
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	353.2	

Analysis Batch: 212872

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	353.2	

Analysis Batch: 213230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	SM 2510B	
480-70932-2	OC-ISCO2	Total/NA	Surface Water	SM 2510B	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	SM 2510B	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	SM 2510B	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	SM 2510B	
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	SM 2510B	
480-70932-7	OC-SD-17	Total/NA	Surface Water	SM 2510B	
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	SM 2510B	
LCS 480-213230/1	Lab Control Sample	Total/NA	Water	SM 2510B	

General Chemistry (Continued)

Analysis Batch: 213230 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-213230/23	Lab Control Sample	Total/NA	Water	SM 2510B	

Analysis Batch: 214540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	300.0	
480-70932-1 MS	OC-ISCO1	Total/NA	Surface Water	300.0	
LCS 480-214540/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-214540/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 214542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-2	OC-ISCO2	Total/NA	Surface Water	300.0	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	300.0	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	300.0	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	300.0	
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	300.0	
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	300.0	
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	300.0	
480-70932-7	OC-SD-17	Total/NA	Surface Water	300.0	
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	300.0	
LCS 480-214542/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-214542/32	Method Blank	Total/NA	Water	300.0	

Prep Batch: 214545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	Distill/Ammonia	
480-70932-2	OC-ISCO2	Total/NA	Surface Water	Distill/Ammonia	
480-70932-3	OC-ISCO3	Total/NA	Surface Water	Distill/Ammonia	
480-70932-3 MS	OC-ISCO3	Total/NA	Surface Water	Distill/Ammonia	
480-70932-3 MSD	OC-ISCO3	Total/NA	Surface Water	Distill/Ammonia	
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-4 DU	OC-PZ-16RRSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-5 MS	OC-PZ-17RRSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-7	OC-SD-17	Total/NA	Surface Water	Distill/Ammonia	
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	Distill/Ammonia	
LCS 480-214545/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214545/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 214770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	Distill/Ammonia	
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	Distill/Ammonia	
LCS 480-214770/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-214770/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 214913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-1	OC-ISCO1	Total/NA	Surface Water	350.1	214545
480-70932-2	OC-ISCO2	Total/NA	Surface Water	350.1	214545

General Chemistry (Continued)

Analysis Batch: 214913 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70932-3	OC-ISCO3	Total/NA	Surface Water	350.1	214545
480-70932-3 MS	OC-ISCO3	Total/NA	Surface Water	350.1	214545
480-70932-3 MSD	OC-ISCO3	Total/NA	Surface Water	350.1	214545
480-70932-4	OC-PZ-16RRSW	Total/NA	Surface Water	350.1	214545
480-70932-4 DU	OC-PZ-16RRSW	Total/NA	Surface Water	350.1	214545
480-70932-5	OC-PZ-17RRSW	Total/NA	Surface Water	350.1	214545
480-70932-5 MS	OC-PZ-17RRSW	Total/NA	Surface Water	350.1	214545
480-70932-6	OC-PZ-18RSW	Total/NA	Surface Water	350.1	214770
480-70932-6 MS	OC-PZ-18RSW	Total/NA	Surface Water	350.1	214770
480-70932-6 MSD	OC-PZ-18RSW	Total/NA	Surface Water	350.1	214770
480-70932-7	OC-SD-17	Total/NA	Surface Water	350.1	214545
480-70932-8	OC-DUP SW PZ18RSW	Total/NA	Surface Water	350.1	214545
LCS 480-214545/1-A	Lab Control Sample	Total/NA	Water	350.1	214545
LCS 480-214770/1-A	Lab Control Sample	Total/NA	Water	350.1	214770
MB 480-214545/2-A	Method Blank	Total/NA	Water	350.1	214545
MB 480-214770/2-A	Method Blank	Total/NA	Water	350.1	214770

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Client Sample ID: OC-ISCO1

Lab Sample ID: 480-70932-1

Date Collected: 11/06/14 09:50

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:10	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:11	AMH	TAL BUF
Total/NA	Analysis	300.0		10	214540	11/18/14 13:04	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		10	214913	11/19/14 11:37	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 22:23	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:23	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:33	VAJ	TAL BUF

Client Sample ID: OC-ISCO2

Lab Sample ID: 480-70932-2

Date Collected: 11/06/14 08:25

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:13	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:14	AMH	TAL BUF
Total/NA	Analysis	300.0		20	214542	11/18/14 14:05	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		20	214913	11/19/14 11:38	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 22:24	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:24	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:34	VAJ	TAL BUF

Client Sample ID: OC-ISCO3

Lab Sample ID: 480-70932-3

Date Collected: 11/06/14 08:10

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:15	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:16	AMH	TAL BUF
Total/NA	Analysis	300.0		20	214542	11/18/14 14:15	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		1	214913	11/19/14 10:07	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 22:25	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:25	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:37	VAJ	TAL BUF

Client Sample ID: OC-PZ-16RRSW

Lab Sample ID: 480-70932-4

Date Collected: 11/06/14 08:45

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:18	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:19	AMH	TAL BUF
Total/NA	Analysis	300.0		20	214542	11/18/14 14:25	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		20	214913	11/19/14 11:39	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 20:32	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:32	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:39	VAJ	TAL BUF

Client Sample ID: OC-PZ-17RRSW

Lab Sample ID: 480-70932-5

Date Collected: 11/06/14 09:00

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:21	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:22	AMH	TAL BUF
Total/NA	Analysis	300.0		20	214542	11/18/14 14:35	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		20	214913	11/19/14 11:41	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 20:33	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:33	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:40	VAJ	TAL BUF

Client Sample ID: OC-PZ-18RSW

Lab Sample ID: 480-70932-6

Date Collected: 11/06/14 09:35

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:23	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:24	AMH	TAL BUF
Total/NA	Analysis	300.0		10	214542	11/18/14 14:46	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214770	11/18/14 15:20	KMF	TAL BUF
Total/NA	Analysis	350.1		10	214913	11/19/14 12:15	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 22:28	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:28	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:41	VAJ	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Client Sample ID: OC-SD-17

Lab Sample ID: 480-70932-7

Date Collected: 11/06/14 09:20

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:44	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:45	AMH	TAL BUF
Total/NA	Analysis	300.0		20	214542	11/18/14 15:16	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		40	214913	11/19/14 12:21	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 20:34	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212868	11/07/14 22:34	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:43	VAJ	TAL BUF

Client Sample ID: OC-DUP SW PZ18RSW

Lab Sample ID: 480-70932-8

Date Collected: 11/06/14 09:35

Matrix: Surface Water

Date Received: 11/07/14 01:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			212959	11/10/14 08:15	EJT	TAL BUF
Dissolved	Analysis	6010		1	213792	11/13/14 02:47	AMH	TAL BUF
Total/NA	Prep	3005A			212924	11/10/14 09:56	KJ1	TAL BUF
Total/NA	Analysis	6010		1	213792	11/12/14 18:48	AMH	TAL BUF
Total/NA	Analysis	300.0		10	214542	11/18/14 15:26	NDB	TAL BUF
Total/NA	Prep	Distill/Ammonia			214545	11/14/14 16:17	RS	TAL BUF
Total/NA	Analysis	350.1		10	214913	11/19/14 11:44	KMF	TAL BUF
Total/NA	Analysis	353.2		1	212871	11/07/14 20:09	MRF	TAL BUF
Total/NA	Analysis	353.2		1	212872	11/07/14 20:09	MRF	TAL BUF
Total/NA	Analysis	SM 2510B		1	213230	11/10/14 21:44	VAJ	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
353.2		Surface Water	Nitrate as N

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Surface Water	Aluminum
6010	3005A	Surface Water	Chromium
6010	3005A	Surface Water	Sodium
SM 2510B		Surface Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surfacewater Quarterly

TestAmerica Job ID: 480-70932-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70932-1	OC-ISCO1	Surface Water	11/06/14 09:50	11/07/14 01:45
480-70932-2	OC-ISCO2	Surface Water	11/06/14 08:25	11/07/14 01:45
480-70932-3	OC-ISCO3	Surface Water	11/06/14 08:10	11/07/14 01:45
480-70932-4	OC-PZ-16RRSW	Surface Water	11/06/14 08:45	11/07/14 01:45
480-70932-5	OC-PZ-17RRSW	Surface Water	11/06/14 09:00	11/07/14 01:45
480-70932-6	OC-PZ-18RSW	Surface Water	11/06/14 09:35	11/07/14 01:45
480-70932-7	OC-SD-17	Surface Water	11/06/14 09:20	11/07/14 01:45
480-70932-8	OC-DUP SW PZ18RSW	Surface Water	11/06/14 09:35	11/07/14 01:45

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70932-1

Login Number: 70932

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Shauna Iacozzi / Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56528-8569.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Surface Water Quarterly Event Desc: Surfacewater Quarterly (Ma	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3

480-70932 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Total Al/Cr/Na	6010MCP - Dissolved Al/Cr/Na	2510B, 353.2, 353.2_Nitrite, Nitrate_Calc	Total Number	Special Instructions/Note:
			Preservation Code:				N	S	D	D	N		
OC-ISCO1	11-6-14	9:50	G	Water	✓		X	X	X	X	X	5	
OC-ISCO2	11-6-14	8:25	G	Water	✓		X	X	X	X	X	5	
OC-ISCO3	11-6-14	8:10	G	Water	✓		X	X	X	X	X	5	
OC-PZ-16RRSW	11-6-14	8:45	G	Water	✓		X	X	X	X	X	5	
OC-PZ-17RRSW	11-6-14	9:00	G	Water	✓		X	X	X	X	X	5	
OC-PZ-18RSW	11-6-14	9:35	G	Water	✓		X	X	X	X	X	5	
OC-SD-17	11-6-14	9:20	G	Water	✓		X	X	X	X	X	5	
OC-DUP SW PZ18R	11-6-14	9:35	G	Water	✓	✓	X	X	X	X	X	5	
OC-PZ18RSW MS	11-6-14	9:35	G	Water	✓	✓	X	X	X	X	X	5	
OC-PZ18RSW MSD	11-6-14	9:35	G	Water	✓	✓	X	X	X	X	X	5	
				Water									

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Brian Guichard	Date/Time: 11-6-14 1310	Company	Received by: Jerry Cah	Date/Time: 11-6-14 1310	Company
Relinquished by: Jerry Cah	Date/Time: 11-6-14 1625	Company	Received by: [signature]	Date/Time: 11/07/14 0145	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.2 #1

July 1, 2015

To: James Cashwell
From: Chris Ricardi
Subject: 51 Eames Street Property Plant B
Quarterly Groundwater November 2014 and May 2015

DATA VALIDATION REPORT
NOVEMBER 2014 AND MAY 2015 PLANT B QUARTERLY GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Sets 480-70789-1 (November) and 480-81081-1 (May)

1.0 INTRODUCTION

Groundwater samples were collected from monitoring wells in November 2014 and May 2015 as specified for Plant B monitoring quarterly sampling in the Interim Response Step Work Plan (IRSWP) [MACTEC, 2007]. The samples were analyzed by TestAmerica Laboratories in Buffalo, New York. Data were reported in sample delivery groups (SDG) 480-70789-1 and 480-81081-1. A summary of samples and analyses included in this review is contained in Table 1. The samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), Standard Methods (APHA, 1995), or Massachusetts Department of Environmental Protection (MassDEP, 2004) methods:

- Trimethylpentenes by USEPA Method 8260C
- Bis(2-ethylhexyl)phthalate and N-nitrosodiphenylamine (NDPA) by USEPA Method 8270D
- Volatile Petroleum Hydrocarbons (VPH) by MassDEP VPH
- Dissolved Iron by USEPA Method 6010C
- Ammonia by USEPA Method 350.1 (Lachat 10-107-06-1)
- pH by USEPA Method 9040C

Results were reviewed using method performance goals identified in the Olin Wilmington IRSWP and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010]. The analytical package was reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of data validation actions and associated qualifier reason codes is presented on Table 3.

2.0 TRIMETHYLPENTENES

Target analytes include 2,4,4 trimethyl-1-pentene and 2,4,4 trimethyl-2-pentene. The data were evaluated based on the following parameters:

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

* Data Completeness
* Holding Time
* Blanks
* Surrogate Recovery
  Laboratory Control Sample (LCS)
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** indicates that criteria were met for this parameter

LCS

480-70789-1 (November 2014)

2,4,4-Trimethyl-2-pentene had a percent recovery of 139 and was above the upper control limit of 130 in the LCS (480-213301/4) associated with a subset of samples in SDG 480-70789-1. Results were qualified estimated (J) and assigned a reason code of LCS-H in Table 3.

3.0 BIS(2-ETHYLHEXYL)PHTHALATE AND NDPA

Target compounds include bis(2-ethylhexyl)phthalate and n-nitrosodiphenylamine (NDPA). The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Surrogate Recovery
* Laboratory Control Sample
  Matrix Spike (MS/MSD)
  Field Duplicate
  Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** indicates that criteria were met for this parameter

Field Duplicate

480-70789-1 (November 2014)

Field duplicates were collected from location OC-GW-16R. Gross differences in concentration were observed for NDPA in the original sample (88 µg/L) and the field duplicate (0.6 µg/L). The RPD between the concentrations reported for NDPA in OC-GW-16R and OC-GW-16R DUP was 197 and above the control limit of 50. Results for NDPA were qualified as estimated (J) and assigned a reason code of FD in Table 3. No gross differences were observed for field duplicate data for other parameters indicating this field duplicate precision problem is limited to the SVOC method.

Matrix Spike

480-70789-1 (November 2014)

A matrix spike and matrix spike duplicate was analyzed on sample OC-GW-16R. Recoveries of NDPA (MSD = -126) and bis(2-ethylhexyl)phthalate (MS = 35 and MSD = 31) were less than the goal of 40 percent. Bis(2-ethylhexyl)phthalate was not detected in sample OC-GW-16R and OC-GW-16R DUP and the reporting limit was qualified estimated (UJ). The relative percent

difference (RPD) between the percent recovered in MS and MSD was grossly above the control limit of 20 for NDPA (93). Positive detections for NDPA were qualified estimated (J) in OC-GW-16R and OC-GW-16R DUP. Results were assigned a reason code of MS-L and MS-RPD in Table 3.

Reporting Limits

SDG 480-70789-1 (November 2014)

A dilution analysis was performed on the following samples due to elevated target compounds: OC-GW-101 (2.5X) and OC-GW-16R (2X). Compounds that were not detected have elevated reporting limits.

4.0 VOLATILE PETROLEUM HYDROCARBONS (VPH)

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
  Blanks
  Surrogate Recovery
* Laboratory Control Sample
  MS/MSD
  Field Duplicate
  Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** indicates that criteria were met for this parameter

Blanks

SDG 480-70789-1 (November 2014)

Methyl tertbutyl ether (MTBE) was reported in the method blank (0.55J µg/L) and trip blank (0.56J µg/L). An action level was calculated at five times the concentration reported in the blanks and compared to the sample results. Low level detections of MTBE were reported below the action level and results were qualified non-detect (U) in the following samples: OC-B-03, OC-GW-101, OC-GW-13, OC-GW-16R, OC-GW-16R DUP, and OC-IW-10. Results were assigned a reason code of BL1 and BL2 in Table 3.

Surrogates

SDG 480-70789-1 (November 2014)

The surrogate percent recovery for 2,5-dibromotoluene was above the upper control limit of 130 in the following samples: OC-GW-16R (142), OC-GW-16R DUP (143), and OC-IW-10 (131). Results for compounds that were detected were qualified estimated (J) and assigned a reason code of SS-H in Table 3.

MS/MSD

SDG 480-70789-1 (November 2014)

A MS/MSD was analyzed on sample OC-GW-16R. The following compounds had percent recoveries that were above the upper control limit of 130: o-xylene (MS = 157 and MSD = 160) and C9–C12 aliphatics (MS = 222 and MSD 242). Positive detections for these compounds

were qualified estimated (J) in OC-GW-16R and OC-GW-16R DUP and assigned a reason code of MS-H in Table 3.

Field Duplicate

SDG 480-70789-1 (November 2014)

The RPD between the concentrations reported for C9–C12 aliphatic (80) and C9-C12 aliphatic (unadjusted) (52) in OC-GW-16R and OC-GW-16R DUP above the control limit of 50. Results for these compounds were qualified as estimated (J) in OC-GW-16R and OC-GW-16R DUP and assigned a reason code of FD in Table 3.

Reporting Limits

SDG 480-81081-1 (May 2015)

A 100x dilution analysis was performed on sample OC-GW-16R due to elevated target compounds. Compounds that were not detected have elevated reporting limits.

5.0 METALS (DISSOLVED IRON)

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample
* MS/MSD
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** indicates that criteria were met for this parameter

6.0 GENERAL CHEMISTRY – AMMONIA, pH

The data were evaluated based on the following parameters:

* Data Completeness
  Holding Time
* Blanks
* Laboratory Control Sample
  MS (ammonia only)
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** indicates that criteria were met for this parameter

Holding Time

SDG 480-70789-1 (November 2014) and SDG 480-81081-1 (May 2015)

The hold time goal for pH is to analyze samples on the day they are collected. Sample analyses were completed one to two days after collection. The results for pH were qualified estimated (J) and assigned a reason code of HT in Table 3.

MS

SDG 480-70789-1 (November 2014)

A MS was analyzed on sample OC-IW-6 and ammonia (51) had a percent recovery that was below the lower control limit of 75. The result for ammonia was qualified estimated in sample OC-IW-6 and assigned a reason code of MS-L in Table 3.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

7/1/15

Chris Ricardi, NRCC-EAC
Senior Chemist

Date

7/1/15

Michael Murphy
Project Principal

Date

REFERENCES:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW., Washington, D.C. 20005.

MACTEC, 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8, 2007.

Massachusetts Department of Environmental Protection (MassDEP), 2004. "Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)"; Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; Revision 1.1; May 2004.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July 2010.

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996 with revisions.

Table 1
Sample Summary
Data Validation Report
November 2014 and May 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Plant B Groundwater					**Method Class**	VOCs	SVOCs	VPH	Metals	Inorganics & Wet Chem	Inorganics & Wet Chem
					Analysis Method	SW8260C	SW8270D	MAVPH	SW6010	SW9040C	E350.1
					Fraction	N	N	N	D	T	T
SDG	**Location**	**Sample ID**	**Sample Date**	**Media**	**Qc Code**	Param_Count	Param_Count	Param_Count	Param_Count	Param_Count	Param_Count
480-70789-1	B-03	OC-B-03	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	GW-101	OC-GW-101	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	GW-13	OC-GW-13	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	GW-16R	OC-GW-16R	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	GW-16R	OC-GW-16R DUP	11/5/2014	GW	FD	2	2	12	1	1	1
480-70789-1	IW-10	OC-IW-10	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	IW-6	OC-IW-6	11/5/2014	GW	FS	2	2	12	1	1	1
480-70789-1	QC	TRIP BLANK	11/5/2014	BW	TB	2		12			
480-81081-1	GW-16R	OC-GW-16R	5/27/2015	GW	FS	2	2	12	1	1	1

Notes:
Number listed under method indicates number of target analytes reported.

Created by/Date: BJS 6/18/15
Checked by/Date: TLC 6/24/15

Table 2
Final Results Summary
Data Validation Report
November 2014 and May 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		480-70789-1		480-70789-1		480-70789-1		480-70789-1		480-70789-1	
		Location		B-03		GW-101		GW-13		GW-16R		GW-16R	
		Field Sample Date		11/5/2014 9:10		11/5/2014 10:55		11/5/2014 13:17		11/5/2014 8:25		11/5/2014 8:25	
		Field Sample ID		OC-B-03		OC-GW-101		OC-GW-13		OC-GW-16R		OC-GW-16R DUP	
		Qc Code		FS		FS		FS		FS		FD	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	2,4,4-Trimethyl-1-pentene	ug/l	1	U	92		4.5		1200		1200	
SW8260C	N	2,4,4-Trimethyl-2-pentene	ug/l	1	U	19	J	1.7	J	450	J	420	J
SW8270	N	Bis(2-Ethylhexyl)phthalate	ug/l										
SW8270	N	N-Nitrosodiphenylamine	ug/l										
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l	1.9	U	4.9	U	1.9	U	3.8	UJ	1.9	UJ
SW8270D	N	N-Nitrosodiphenylamine	ug/l	0.34	J	110		4.8	U	88	J	0.6	J
MAVPH	N	Benzene	ug/l	1	U	1	U	1	U	2.5	J	2.4	J
MAVPH	N	C5-C8 Aliphatics	ug/l	5	U	110		11		490	J	490	J
MAVPH	N	C5-C8 Aliphatics (unadj.)	ug/l	5	U	110		12		510	J	510	J
MAVPH	N	C9-C10 Aromatics (unadj.)	ug/l	5	U	5	U	5	U	23	J	24	J
MAVPH	N	C9-C12 Aliphatics	ug/l	5	U	2.9	J	5	U	26	J	61	J
MAVPH	N	C9-C12 Aliphatics (unadj.)	ug/l	5	U	2.9	J	5	U	51	J	87	J
MAVPH	N	Ethyl benzene	ug/l	1	U	1	U	1	U	1.8	J	2.2	J
MAVPH	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	2.6	U	2.7	U
MAVPH	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U	1	U
MAVPH	N	Toluene	ug/l	1	U	0.81	J	1	U	12	J	13	J
MAVPH	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U	1	U
MAVPH	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U	2	U
E350.1	T	Ammonia	mg/l	0.57		1.9		0.2	U	4.2		4.3	
SW6010	D	Iron	ug/l	50	U	6800		130		2100		2100	
SW9040C	T	pH	pH units	5.43	J	6.04	J	5.24	J	6.24	J	6.46	J

Notes:
N = normal
T = total
D = dissolved/filtered
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter

Table 2
Final Results Summary
Data Validation Report
November 2014 and May 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		480-70789-1		480-70789-1		480-70789-1		480-81081-1	
		Location		IW-10		IW-6		QC		GW-16R	
		Field Sample Date		11/5/2014 10:50		11/5/2014 11:15		11/5/2014 0:00		5/27/2015 8:35	
		Field Sample ID		OC-IW-10		OC-IW-6		TRIP BLANK		OC-GW-16R	
		Qc Code		FS		FS		TB		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	2,4,4-Trimethyl-1-pentene	ug/l	0.96	J	1400		1	U	1700	
SW8260C	N	2,4,4-Trimethyl-2-pentene	ug/l	0.75	J	270	J	1	U	510	
SW8270	N	Bis(2-Ethylhexyl)phthalate	ug/l							5.3	U
SW8270	N	N-Nitrosodiphenylamine	ug/l							1.5	J
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l	1.9	U	5.5					
SW8270D	N	N-Nitrosodiphenylamine	ug/l	4.8	U	0.92	J				
MAVPH	N	Benzene	ug/l	1	U	2.5		1	U	100	U
MAVPH	N	C5-C8 Aliphatics	ug/l	5	U	480		5	U	1200	
MAVPH	N	C5-C8 Aliphatics (unadj.)	ug/l	5	U	510		5	U	1200	
MAVPH	N	C9-C10 Aromatics (unadj.)	ug/l	5	U	3.8	J	5	U	500	U
MAVPH	N	C9-C12 Aliphatics	ug/l	5	U	50		5	U	500	U
MAVPH	N	C9-C12 Aliphatics (unadj.)	ug/l	5	U	61		5	U	500	U
MAVPH	N	Ethyl benzene	ug/l	1	U	3.3		1	U	100	U
MAVPH	N	Methyl Tertbutyl Ether	ug/l	1	U	4.9	B	0.56	J B	100	U
MAVPH	N	Naphthalene	ug/l	1	U	1	U	1	U	100	U
MAVPH	N	Toluene	ug/l	1	U	23		1	U	100	U
MAVPH	N	Xylene, o	ug/l	1	U	3.5		1	U	100	U
MAVPH	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	200	U
E350.1	T	Ammonia	mg/l	48		0.67	J			3.7	
SW6010	D	Iron	ug/l	710		9200				1900	
SW9040C	T	pH	pH units	7.45	J	6.38	J			6.09	J

Notes:

N = normal

T = total

D = dissolved/filtered

FS = field sample

FD = field duplicate

U = not detected, value is the quantitation limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

Created by/Date: KMS 6/23/15

Checked by/Date: TLC 6/24/15

Table 3
Validation Qualification Action Summary
Data Validation Report
November 2014 and May 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Analysis Method	Lab Sample ID	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validated Qualifier	Val Reason Code	Result Units	Lab ID
480-70789-1	E350.1	480-70789-6	OC-IW-6	Ammonia	0.67		0.67	J	MS-L	mg/l	TALBFLO
480-70789-1	MAVPH	480-70789-2	OC-B-03	Methyl Tertbutyl Ether	0.57	J B	1	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-3	OC-GW-101	Methyl Tertbutyl Ether	0.78	J B	1	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-4	OC-GW-13	Methyl Tertbutyl Ether	0.61	J B	1	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	Benzene	2.5		2.5	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	C5-C8 Aliphatics	490		490	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	C5-C8 Aliphatics (unadj.)	510		510	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	C9-C10 Aromatics (unadj.)	23		23	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	C9-C12 Aliphatics	26		26	J	SS-H, MS-H, FD	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	C9-C12 Aliphatics (unadj.)	51		51	J	SS-H, MS-H, FD	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	Ethyl benzene	1.8		1.8	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	Methyl Tertbutyl Ether	2.6	B	2.6	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-1	OC-GW-16R	Toluene	12		12	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	Benzene	2.4		2.4	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	C5-C8 Aliphatics	490		490	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	C5-C8 Aliphatics (unadj.)	510		510	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	C9-C10 Aromatics (unadj.)	24		24	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	C9-C12 Aliphatics	61		61	J	SS-H, MS-H, FD	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	C9-C12 Aliphatics (unadj.)	87		87	J	SS-H, MS-H, FD	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	Ethyl benzene	2.2		2.2	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	Methyl Tertbutyl Ether	2.7	B	2.7	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-7	OC-GW-16R DUP	Toluene	13		13	J	SS-H	ug/l	TALBFLO
480-70789-1	MAVPH	480-70789-5	OC-IW-10	Methyl Tertbutyl Ether	0.59	J B	1	U	BL1, BL2	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-3	OC-GW-101	2,4,4-Trimethyl-2-pentene	19	*	19	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-4	OC-GW-13	2,4,4-Trimethyl-2-pentene	1.7	*	1.7	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-1	OC-GW-16R	2,4,4-Trimethyl-2-pentene	450	*	450	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-7	OC-GW-16R DUP	2,4,4-Trimethyl-2-pentene	420	*	420	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-5	OC-IW-10	2,4,4-Trimethyl-2-pentene	0.75	J *	0.75	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8260C	480-70789-6	OC-IW-6	2,4,4-Trimethyl-2-pentene	270	*	270	J	LCS-H	ug/l	TALBFLO
480-70789-1	SW8270D	480-70789-1	OC-GW-16R	Bis(2-Ethylhexyl)phthalate	3.8	U	3.8	UJ	MS-L	ug/l	STL NC
480-70789-1	SW8270D	480-70789-1	OC-GW-16R	N-Nitrosodiphenylamine	88		88	J	MS-L, MS-RPD, FD	ug/l	STL NC
480-70789-1	SW8270D	480-70789-7	OC-GW-16R DUP	Bis(2-Ethylhexyl)phthalate	1.9	U	1.9	UJ	MS-L	ug/l	STL NC
480-70789-1	SW8270D	480-70789-7	OC-GW-16R DUP	N-Nitrosodiphenylamine	0.6	J	0.6	J	MS-L, MS-RPD, FD	ug/l	STL NC
480-70789-1	SW9040C	480-70789-2	OC-B-03	pH	5.43	HF	5.43	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-3	OC-GW-101	pH	6.04	HF	6.04	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-4	OC-GW-13	pH	5.24	HF	5.24	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-1	OC-GW-16R	pH	6.24	HF	6.24	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-7	OC-GW-16R DUP	pH	6.46	HF	6.46	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-5	OC-IW-10	pH	7.45	HF	7.45	J	HT	pH units	TA-WST
480-70789-1	SW9040C	480-70789-6	OC-IW-6	pH	6.38	HF	6.38	J	HT	pH units	TA-WST
480-81081-1	SW9040C	480-81081-1	OC-GW-16R	pH	6.09	HF	6.09	J	HT	pH units	TALBFLO

Units:
mg/l = milligram per liter
ug/l = microgram per liter

Validation Qualifier:
J = value is estimated
U = not detected, value is the quantitation limit

Validation Reason Codes:
BL1 = Method blank qualifier
BL2 = Field QC blank qualifier
FD = Field duplicate limit exceeded
HT = Holding time for prep or analysis exceeded
LCS-H = LCS recovery high
MS-H = MS and/or MSD recovery high
MS-L = MS and/or MSD recovery low
MS-RPD = MS/MDS RPD limit exceeded
SS-H = Surrogate recovery above limits

Created by/Date: KMS 6/23/15
Checked by/Date: TLC 6/24/15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-70789-1
Client Project/Site: Plant B
Sampling Event: Plant B Annual (Nov)

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
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Rich Emerich, Analyst V
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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD Recovery exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD Recovery exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-70789-1

Laboratory: TestAmerica Buffalo

Narrative

Comments
The 6010 metals and 8260 compounds specified are not part of the MCP list and have thus not been qualified with regard to the MCP requirements for presumptive certainty.

Receipt
The samples were received on 11/6/2014 2:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.4º C and 3.3º C.

Receipt Exceptions
A trip blank was submitted for analysis with these samples, however it was not listed on the Chain of Custody (COC). A sample receipt date of 11/05/2014 at 00:00 was used for sample login.

The following samples was submitted for analysis, however they were not listed on the Chain-of-Custody (COC): OC-GW-16R (480-70789-1), OC-GW-16R (480-70789-1 MS), OC-GW-16R (480-70789-1 MSD) and OC-GW-16R DUP (480-70789-7).

GC/MS VOA
Method 8260C: The laboratory control sample (LCS) and / or the laboratory control sample duplicate (LCSD) for batch 213205 exceeded control limits for the following analytes: 2,4,4-Trimethyl-2-pentene.. MCP protocol allows for 10% of the target compounds to be outside of the limits provided the recoveries are over 10%. (LCS 480-213205/4), (LCSD 480-213205/5)

Method 8260C: The laboratory control sample (LCS) and / or the laboratory control sample duplicate (LCSD) for batch 213304 exceeded control limits for the following analytes: 2,4,4-Trimethyl-2-pentene.. MCP protocol allows for 10% of the target compounds to be outside of the limits provided the recoveries are over 10%.

Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW-101 (480-70789-3), OC-GW-16R (480-70789-1), OC-GW-16R DUP (480-70789-7) and OC-IW-6 (480-70789-6). Elevated reporting limits (RLs) are provided.

Method 8260C: The laboratory control sample (LCS) and / or the laboratory control sample duplicate (LCSD) for batch 213577 exceeded control limits for the following analytes:2,4,4-Trimethyl-2-Pentene.for 10% of the target compounds to be outside of the limits provided the recoveries are over 10%.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270: At the request of the client, an abbreviated MCP compound list was reported for this job.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method MAVPH: Due to the high concentration of analytes, the matrix spike / matrix spike duplicate (MS/MSD) for batch 212445 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 350.1: The method blank for batch 213373 contained ammonia above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of the following sample was not performed: OC-GW-16R (480-70789-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 480-70789-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-70789-1**

Project Location: **Plant B** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-70789-1 [1-7]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ■	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ■	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	■ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ■ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 11/20/14 16:35

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Client Sample ID: OC-GW-16R — Lab Sample ID: 480-70789-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1200		20	8.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	450	*	20	8.6	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine	88		9.6	0.60	ug/L	2		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	490		5.0	1.5	ug/L	1		MA VPH	Total/NA
C9-C12 Aliphatics (adjusted)	26		5.0	1.5	ug/L	1		MA VPH	Total/NA
Benzene	2.5		1.0	0.25	ug/L	1		MAVPH	Total/NA
Ethylbenzene	1.8		1.0	0.25	ug/L	1		MAVPH	Total/NA
Methyl tert-butyl ether	2.6	B	1.0	0.25	ug/L	1		MAVPH	Total/NA
Toluene	12		1.0	0.25	ug/L	1		MAVPH	Total/NA
C5-C8 Aliphatics	510		5.0	1.5	ug/L	1		MAVPH	Total/NA
C9-C10 Aromatics	23		5.0	0.50	ug/L	1		MAVPH	Total/NA
C9-C12 Aliphatics	51		5.0	1.5	ug/L	1		MAVPH	Total/NA
Iron	2100		50	19	ug/L	1		6010	Dissolved
Ammonia	4.2	B	1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.24	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-B-03 — Lab Sample ID: 480-70789-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodiphenylamine	0.34	J	4.9	0.30	ug/L	1		8270D	Total/NA
Methyl tert-butyl ether	0.57	J B	1.0	0.25	ug/L	1		MAVPH	Total/NA
Ammonia	0.57		0.20	0.10	mg/L	1		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.43	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-GW-101 — Lab Sample ID: 480-70789-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	92		4.0	1.6	ug/L	4		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	19	*	4.0	1.7	ug/L	4		8260C	Total/NA
N-Nitrosodiphenylamine	110		12	0.75	ug/L	2.5		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	110		5.0	1.5	ug/L	1		MA VPH	Total/NA
C9-C12 Aliphatics (adjusted)	2.9	J	5.0	1.5	ug/L	1		MA VPH	Total/NA
Methyl tert-butyl ether	0.78	J B	1.0	0.25	ug/L	1		MAVPH	Total/NA
Toluene	0.81	J	1.0	0.25	ug/L	1		MAVPH	Total/NA
C5-C8 Aliphatics	110		5.0	1.5	ug/L	1		MAVPH	Total/NA
C9-C12 Aliphatics	2.9	J	5.0	1.5	ug/L	1		MAVPH	Total/NA
Iron	6800		50	19	ug/L	1		6010	Dissolved
Ammonia	1.9		0.20	0.10	mg/L	1		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.04	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-GW-13 — Lab Sample ID: 480-70789-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	4.5		1.0	0.40	ug/L	1		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	1.7	*	1.0	0.43	ug/L	1		8260C	Total/NA
C5-C8 Aliphatics (adjusted)	11		5.0	1.5	ug/L	1		MA VPH	Total/NA
Methyl tert-butyl ether	0.61	J B	1.0	0.25	ug/L	1		MAVPH	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-13 (Continued) — Lab Sample ID: 480-70789-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
C5-C8 Aliphatics	12		5.0	1.5	ug/L	1		MAVPH	Total/NA
Iron	130		50	19	ug/L	1		6010	Dissolved
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.24	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-IW-10 — Lab Sample ID: 480-70789-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	0.96	J	1.0	0.40	ug/L	1		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	0.75	J *	1.0	0.43	ug/L	1		8260C	Total/NA
Methyl tert-butyl ether	0.59	J B	1.0	0.25	ug/L	1		MAVPH	Total/NA
Iron	710		50	19	ug/L	1		6010	Dissolved
Ammonia	48	B	10	5.0	mg/L	50		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	7.45	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-IW-6 — Lab Sample ID: 480-70789-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1400		20	8.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	270	*	20	8.6	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine	0.92	J	4.9	0.30	ug/L	1		8270D	Total/NA
Bis(2-ethylhexyl) phthalate	5.5		2.0	1.7	ug/L	1		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	480		5.0	1.5	ug/L	1		MA VPH	Total/NA
C9-C12 Aliphatics (adjusted)	50		5.0	1.5	ug/L	1		MA VPH	Total/NA
Benzene	2.5		1.0	0.25	ug/L	1		MAVPH	Total/NA
Ethylbenzene	3.3		1.0	0.25	ug/L	1		MAVPH	Total/NA
Methyl tert-butyl ether	4.9	B	1.0	0.25	ug/L	1		MAVPH	Total/NA
o-Xylene	3.5		1.0	0.25	ug/L	1		MAVPH	Total/NA
Toluene	23		1.0	0.25	ug/L	1		MAVPH	Total/NA
C5-C8 Aliphatics	510		5.0	1.5	ug/L	1		MAVPH	Total/NA
C9-C10 Aromatics	3.8	J	5.0	0.50	ug/L	1		MAVPH	Total/NA
C9-C12 Aliphatics	61		5.0	1.5	ug/L	1		MAVPH	Total/NA
Iron	9200		50	19	ug/L	1		6010	Dissolved
Ammonia	0.67		0.20	0.10	mg/L	1		350.1	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	6.38	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC-GW-16R DUP — Lab Sample ID: 480-70789-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1200		20	8.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	420	*	20	8.6	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine	0.60	J	4.9	0.30	ug/L	1		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	490		5.0	1.5	ug/L	1		MA VPH	Total/NA
C9-C12 Aliphatics (adjusted)	61		5.0	1.5	ug/L	1		MA VPH	Total/NA
Benzene	2.4		1.0	0.25	ug/L	1		MAVPH	Total/NA
Ethylbenzene	2.2		1.0	0.25	ug/L	1		MAVPH	Total/NA
Methyl tert-butyl ether	2.7	B	1.0	0.25	ug/L	1		MAVPH	Total/NA
Toluene	13		1.0	0.25	ug/L	1		MAVPH	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-16R DUP (Continued)

Lab Sample ID: 480-70789-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
C5-C8 Aliphatics	510		5.0	1.5	ug/L	1		MAVPH	Total/NA
C9-C10 Aromatics	24		5.0	0.50	ug/L	1		MAVPH	Total/NA
C9-C12 Aliphatics	87		5.0	1.5	ug/L	1		MAVPH	Total/NA
Iron	2100		50	19	ug/L	1		6010	Dissolved
Ammonia	4.3	B	1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.46	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 480-70789-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	0.56	J B	1.0	0.25	ug/L	1		MAVPH	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-16R

Date Collected: 11/05/14 08:25
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-1

Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	1200		20	8.0	ug/L			11/11/14 16:06	20
2,4,4-Trimethyl-2-pentene	450	*	20	8.6	ug/L			11/11/14 16:06	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 130*		*11/11/14 16:06*	*20*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*		*11/11/14 16:06*	*20*
Toluene-d8 (Surr)	*97*		*70 - 130*		*11/11/14 16:06*	*20*
Dibromofluoromethane (Surr)	*110*		*70 - 130*		*11/11/14 16:06*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	88		9.6	0.60	ug/L		11/11/14 08:44	11/18/14 15:00	2
Bis(2-ethylhexyl) phthalate	ND		3.8	3.3	ug/L		11/11/14 08:44	11/18/14 15:00	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*56*		*30 - 130*	*11/11/14 08:44*	*11/18/14 15:00*	*2*
Terphenyl-d14	*54*		*30 - 130*	*11/11/14 08:44*	*11/18/14 15:00*	*2*
Nitrobenzene-d5	*58*		*30 - 130*	*11/11/14 08:44*	*11/18/14 15:00*	*2*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	490		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	26		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	2.5		1.0	0.25	ug/L			11/06/14 15:51	1
Ethylbenzene	1.8		1.0	0.25	ug/L			11/06/14 15:51	1
Methyl tert-butyl ether	2.6	B	1.0	0.25	ug/L			11/06/14 15:51	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 15:51	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 15:51	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 15:51	1
Toluene	12		1.0	0.25	ug/L			11/06/14 15:51	1
C5-C8 Aliphatics	510		5.0	1.5	ug/L			11/06/14 15:51	1
C9-C10 Aromatics	23		5.0	0.50	ug/L			11/06/14 15:51	1
C9-C12 Aliphatics	51		5.0	1.5	ug/L			11/06/14 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*142*		*73 - 144*		*11/06/14 15:51*	*1*
2,5-Dibromotoluene (pid)	*127*		*81 - 132*		*11/06/14 15:51*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2100		50	19	ug/L		11/06/14 11:35	11/07/14 22:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	4.2	B	1.0	0.50	mg/L		11/11/14 00:22	11/11/14 11:29	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.24	HF	0.100	0.100	SU			11/07/14 14:57	1

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Client Sample ID: OC-B-03
Date Collected: 11/05/14 09:10
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-2
Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			11/11/14 16:32	1
2,4,4-Trimethyl-2-pentene	ND	*	1.0	0.43	ug/L			11/11/14 16:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*11/11/14 16:32*	*1*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*11/11/14 16:32*	*1*
Toluene-d8 (Surr)	*91*		*70 - 130*		*11/11/14 16:32*	*1*
Dibromofluoromethane (Surr)	*110*		*70 - 130*		*11/11/14 16:32*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	**0.34**	**J**	4.9	0.30	ug/L		11/11/14 08:44	11/18/14 14:36	1
Bis(2-ethylhexyl) phthalate	ND		1.9	1.7	ug/L		11/11/14 08:44	11/18/14 14:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*67*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:36*	*1*
Terphenyl-d14	*60*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:36*	*1*
Nitrobenzene-d5	*72*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:36*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 17:46	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 17:46	1
Methyl tert-butyl ether	**0.57**	**J B**	1.0	0.25	ug/L			11/06/14 17:46	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 17:46	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 17:46	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 17:46	1
Toluene	ND		1.0	0.25	ug/L			11/06/14 17:46	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 17:46	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 17:46	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*120*		*73 - 144*		*11/06/14 17:46*	*1*
2,5-Dibromotoluene (pid)	*117*		*81 - 132*		*11/06/14 17:46*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	19	ug/L		11/06/14 11:35	11/07/14 23:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.57**		0.20	0.10	mg/L		11/11/14 00:26	11/11/14 11:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.43**	**HF**	0.100	0.100	SU			11/07/14 15:05	1

Client Sample ID: OC-GW-101
Date Collected: 11/05/14 10:55
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-3
Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	92		4.0	1.6	ug/L			11/11/14 16:56	4
2,4,4-Trimethyl-2-pentene	19	*	4.0	1.7	ug/L			11/11/14 16:56	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*11/11/14 16:56*	*4*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*		*11/11/14 16:56*	*4*
Toluene-d8 (Surr)	*94*		*70 - 130*		*11/11/14 16:56*	*4*
Dibromofluoromethane (Surr)	*108*		*70 - 130*		*11/11/14 16:56*	*4*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	110		12	0.75	ug/L		11/11/14 08:44	11/18/14 16:10	2.5
Bis(2-ethylhexyl) phthalate	ND		4.9	4.1	ug/L		11/11/14 08:44	11/18/14 16:10	2.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*38*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:10*	*2.5*
Terphenyl-d14	*33*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:10*	*2.5*
Nitrobenzene-d5	*37*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:10*	*2.5*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	110		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	2.9	J	5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 18:24	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 18:24	1
Methyl tert-butyl ether	0.78	J B	1.0	0.25	ug/L			11/06/14 18:24	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 18:24	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 18:24	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 18:24	1
Toluene	0.81	J	1.0	0.25	ug/L			11/06/14 18:24	1
C5-C8 Aliphatics	110		5.0	1.5	ug/L			11/06/14 18:24	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 18:24	1
C9-C12 Aliphatics	2.9	J	5.0	1.5	ug/L			11/06/14 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*124*		*73 - 144*		*11/06/14 18:24*	*1*
2,5-Dibromotoluene (pid)	*118*		*81 - 132*		*11/06/14 18:24*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	6800		50	19	ug/L		11/06/14 11:35	11/07/14 23:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	1.9		0.20	0.10	mg/L		11/11/14 00:26	11/11/14 11:10	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.04	HF	0.100	0.100	SU			11/07/14 15:09	1

Client Sample ID: OC-GW-13

Date Collected: 11/05/14 13:17
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-4

Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	**4.5**		1.0	0.40	ug/L			11/11/14 17:21	1
2,4,4-Trimethyl-2-pentene	**1.7**	*	1.0	0.43	ug/L			11/11/14 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 130*		*11/11/14 17:21*	*1*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*11/11/14 17:21*	*1*
Toluene-d8 (Surr)	*92*		*70 - 130*		*11/11/14 17:21*	*1*
Dibromofluoromethane (Surr)	*109*		*70 - 130*		*11/11/14 17:21*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		4.8	0.30	ug/L		11/11/14 08:44	11/18/14 13:50	1
Bis(2-ethylhexyl) phthalate	ND		1.9	1.6	ug/L		11/11/14 08:44	11/18/14 13:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*56*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:50*	*1*
Terphenyl-d14	*62*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:50*	*1*
Nitrobenzene-d5	*61*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:50*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	**11**		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 19:03	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 19:03	1
Methyl tert-butyl ether	**0.61**	**J B**	1.0	0.25	ug/L			11/06/14 19:03	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 19:03	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 19:03	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 19:03	1
Toluene	ND		1.0	0.25	ug/L			11/06/14 19:03	1
C5-C8 Aliphatics	**12**		5.0	1.5	ug/L			11/06/14 19:03	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 19:03	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 19:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*112*		*73 - 144*		*11/06/14 19:03*	*1*
2,5-Dibromotoluene (pid)	*111*		*81 - 132*		*11/06/14 19:03*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**130**		50	19	ug/L		11/06/14 11:35	11/07/14 23:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/11/14 00:26	11/11/14 11:11	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.24**	**HF**	0.100	0.100	SU			11/07/14 15:17	1

Client Sample ID: OC-IW-10
Date Collected: 11/05/14 10:50
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-5
Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	0.96	J	1.0	0.40	ug/L			11/11/14 17:47	1
2,4,4-Trimethyl-2-pentene	0.75	J *	1.0	0.43	ug/L			11/11/14 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 130*		*11/11/14 17:47*	*1*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*11/11/14 17:47*	*1*
Toluene-d8 (Surr)	*93*		*70 - 130*		*11/11/14 17:47*	*1*
Dibromofluoromethane (Surr)	*115*		*70 - 130*		*11/11/14 17:47*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		4.8	0.30	ug/L		11/11/14 08:44	11/18/14 14:13	1
Bis(2-ethylhexyl) phthalate	ND		1.9	1.6	ug/L		11/11/14 08:44	11/18/14 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*52*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:13*	*1*
Terphenyl-d14	*54*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:13*	*1*
Nitrobenzene-d5	*57*		*30 - 130*	*11/11/14 08:44*	*11/18/14 14:13*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 20:19	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 20:19	1
Methyl tert-butyl ether	0.59	J B	1.0	0.25	ug/L			11/06/14 20:19	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 20:19	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 20:19	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 20:19	1
Toluene	ND		1.0	0.25	ug/L			11/06/14 20:19	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 20:19	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 20:19	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 20:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*131*		*73 - 144*		*11/06/14 20:19*	*1*
2,5-Dibromotoluene (pid)	*125*		*81 - 132*		*11/06/14 20:19*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	710		50	19	ug/L		11/06/14 11:35	11/07/14 23:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	48	B	10	5.0	mg/L		11/11/14 19:58	11/12/14 18:54	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.45	HF	0.100	0.100	SU			11/07/14 15:21	1

Client Sample ID: OC-IW-6

Date Collected: 11/05/14 11:15
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-6

Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	1400		20	8.0	ug/L			11/11/14 18:12	20
2,4,4-Trimethyl-2-pentene	270	*	20	8.6	ug/L			11/11/14 18:12	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*11/11/14 18:12*	*20*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*11/11/14 18:12*	*20*
Toluene-d8 (Surr)	*93*		*70 - 130*		*11/11/14 18:12*	*20*
Dibromofluoromethane (Surr)	*110*		*70 - 130*		*11/11/14 18:12*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	0.92	J	4.9	0.30	ug/L		11/11/14 08:44	11/18/14 13:26	1
Bis(2-ethylhexyl) phthalate	5.5		2.0	1.7	ug/L		11/11/14 08:44	11/18/14 13:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*62*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:26*	*1*
Terphenyl-d14	*58*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:26*	*1*
Nitrobenzene-d5	*66*		*30 - 130*	*11/11/14 08:44*	*11/18/14 13:26*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	480		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	50		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	2.5		1.0	0.25	ug/L			11/06/14 20:58	1
Ethylbenzene	3.3		1.0	0.25	ug/L			11/06/14 20:58	1
Methyl tert-butyl ether	4.9	B	1.0	0.25	ug/L			11/06/14 20:58	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 20:58	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 20:58	1
o-Xylene	3.5		1.0	0.25	ug/L			11/06/14 20:58	1
Toluene	23		1.0	0.25	ug/L			11/06/14 20:58	1
C5-C8 Aliphatics	510		5.0	1.5	ug/L			11/06/14 20:58	1
C9-C10 Aromatics	3.8	J	5.0	0.50	ug/L			11/06/14 20:58	1
C9-C12 Aliphatics	61		5.0	1.5	ug/L			11/06/14 20:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*118*		*73 - 144*		*11/06/14 20:58*	*1*
2,5-Dibromotoluene (pid)	*112*		*81 - 132*		*11/06/14 20:58*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	9200		50	19	ug/L		11/06/14 11:35	11/07/14 23:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.67		0.20	0.10	mg/L		11/11/14 00:26	11/11/14 11:14	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.38	HF	0.100	0.100	SU			11/07/14 15:25	1

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Client Sample ID: OC-GW-16R DUP
Date Collected: 11/05/14 08:25
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-7
Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	1200		20	8.0	ug/L			11/11/14 18:38	20
2,4,4-Trimethyl-2-pentene	420	*	20	8.6	ug/L			11/11/14 18:38	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*11/11/14 18:38*	*20*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*11/11/14 18:38*	*20*
Toluene-d8 (Surr)	*93*		*70 - 130*		*11/11/14 18:38*	*20*
Dibromofluoromethane (Surr)	*111*		*70 - 130*		*11/11/14 18:38*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	0.60	J	4.9	0.30	ug/L		11/11/14 08:44	11/18/14 16:33	1
Bis(2-ethylhexyl) phthalate	ND		1.9	1.7	ug/L		11/11/14 08:44	11/18/14 16:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*47*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:33*	*1*
Terphenyl-d14	*46*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:33*	*1*
Nitrobenzene-d5	*50*		*30 - 130*	*11/11/14 08:44*	*11/18/14 16:33*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	490		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	61		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	2.4		1.0	0.25	ug/L			11/06/14 21:36	1
Ethylbenzene	2.2		1.0	0.25	ug/L			11/06/14 21:36	1
Methyl tert-butyl ether	2.7	B	1.0	0.25	ug/L			11/06/14 21:36	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 21:36	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 21:36	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 21:36	1
Toluene	13		1.0	0.25	ug/L			11/06/14 21:36	1
C5-C8 Aliphatics	510		5.0	1.5	ug/L			11/06/14 21:36	1
C9-C10 Aromatics	24		5.0	0.50	ug/L			11/06/14 21:36	1
C9-C12 Aliphatics	87		5.0	1.5	ug/L			11/06/14 21:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*143*		*73 - 144*		*11/06/14 21:36*	*1*
2,5-Dibromotoluene (pid)	*128*		*81 - 132*		*11/06/14 21:36*	*1*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2100		50	19	ug/L		11/06/14 11:35	11/07/14 23:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	4.3	B	1.0	0.50	mg/L		11/11/14 19:58	11/12/14 18:54	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.46	HF	0.100	0.100	SU			11/07/14 15:29	1

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Client Sample ID: TRIP BLANK
Date Collected: 11/05/14 00:00
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70789-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			11/11/14 02:56	1
2,4,4-Trimethyl-2-pentene	ND	*	1.0	0.43	ug/L			11/11/14 02:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*11/11/14 02:56*	*1*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*11/11/14 02:56*	*1*
Toluene-d8 (Surr)	*94*		*70 - 130*		*11/11/14 02:56*	*1*
Dibromofluoromethane (Surr)	*105*		*70 - 130*		*11/11/14 02:56*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1
C9-C12 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			11/07/14 15:51	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 22:15	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 22:15	1
Methyl tert-butyl ether	**0.56**	**J B**	1.0	0.25	ug/L			11/06/14 22:15	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 22:15	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 22:15	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 22:15	1
Toluene	ND		1.0	0.25	ug/L			11/06/14 22:15	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 22:15	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 22:15	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*117*		*73 - 144*		*11/06/14 22:15*	*1*
2,5-Dibromotoluene (pid)	*114*		*81 - 132*		*11/06/14 22:15*	*1*

Surrogate Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
480-70789-1	OC-GW-16R	102	106	97	110
480-70789-1 MS	OC-GW-16R	87	106	97	94
480-70789-1 MSD	OC-GW-16R	88	109	96	94
480-70789-2	OC-B-03	100	101	91	110
480-70789-3	OC-GW-101	101	103	94	108
480-70789-4	OC-GW-13	102	104	92	109
480-70789-5	OC-IW-10	103	101	93	115
480-70789-6	OC-IW-6	100	100	93	110
480-70789-7	OC-GW-16R DUP	101	101	93	111

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
480-70789-8	TRIP BLANK	101	104	94	105
LCS 480-213205/4	Lab Control Sample	108	104	96	102
LCS 480-213304/4	Lab Control Sample	108	105	97	101
LCS 480-214574/4	Lab Control Sample	95	107	93	90
LCSD 480-213205/5	Lab Control Sample Dup	107	102	95	101
LCSD 480-213304/5	Lab Control Sample Dup	106	104	95	99
LCSD 480-214574/5	Lab Control Sample Dup	84	109	93	91
MB 480-213205/7	Method Blank	98	102	95	103
MB 480-213304/7	Method Blank	99	102	93	104
MB 480-214574/7	Method Blank	87	103	89	97

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		FBP	TPH	NBZ
Lab Sample ID	Client Sample ID	(30-130)	(30-130)	(30-130)
480-70789-1	OC-GW-16R	56	54	58
480-70789-1 MS	OC-GW-16R	57	40	61
480-70789-1 MSD	OC-GW-16R	60	38	61
480-70789-2	OC-B-03	67	60	72
480-70789-3	OC-GW-101	38	33	37

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		FBP	TPH	NBZ
Lab Sample ID	Client Sample ID	(30-130)	(30-130)	(30-130)
480-70789-4	OC-GW-13	56	62	61
480-70789-5	OC-IW-10	52	54	57
480-70789-6	OC-IW-6	62	58	66
480-70789-7	OC-GW-16R DUP	47	46	50

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
TPH = Terphenyl-d14
NBZ = Nitrobenzene-d5

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		FBP	TPH	NBZ
Lab Sample ID	Client Sample ID	(30-130)	(30-130)	(30-130)
LCS 240-155974/22-A	Lab Control Sample	75	75	77
LCSD 240-155974/23-A	Lab Control Sample Dup	73	73	78
MB 240-155974/21-A	Method Blank	74	81	79

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
TPH = Terphenyl-d14
NBZ = Nitrobenzene-d5

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		25DBT2	25DBT1
Lab Sample ID	Client Sample ID	(73-144)	(81-132)
480-70789-1	OC-GW-16R	142	127
480-70789-1 MS	OC-GW-16R	143	128
480-70789-1 MSD	OC-GW-16R	142	127
480-70789-2	OC-B-03	120	117
480-70789-3	OC-GW-101	124	118
480-70789-4	OC-GW-13	112	111
480-70789-5	OC-IW-10	131	125
480-70789-6	OC-IW-6	118	112
480-70789-7	OC-GW-16R DUP	143	128

Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

Surrogate Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	25DBT2 (73-144)	25DBT1 (81-132)								
480-70789-8	TRIP BLANK	117	114								
LCS 480-212445/8	Lab Control Sample	99	101								
LCSD 480-212445/9	Lab Control Sample Dup	98	100								
MB 480-212445/7	Method Blank	95	98								

Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 480-213205/7
Matrix: Water
Analysis Batch: 213205

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			11/11/14 02:17	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			11/11/14 02:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*11/11/14 02:17*	*1*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*11/11/14 02:17*	*1*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/11/14 02:17*	*1*
Dibromofluoromethane (Surr)	*103*		*70 - 130*		*11/11/14 02:17*	*1*

Lab Sample ID: LCS 480-213205/4
Matrix: Water
Analysis Batch: 213205

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,4-Trimethyl-1-pentene	25.0	25.3		ug/L		101	70 - 130
2,4,4-Trimethyl-2-pentene	25.0	36.5	*	ug/L		146	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*96*		*70 - 130*
Dibromofluoromethane (Surr)	*102*		*70 - 130*

Lab Sample ID: LCSD 480-213205/5
Matrix: Water
Analysis Batch: 213205

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene	25.0	24.5		ug/L		98	70 - 130	3	20
2,4,4-Trimethyl-2-pentene	25.0	34.8	*	ug/L		139	70 - 130	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 130*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*
Toluene-d8 (Surr)	*95*		*70 - 130*
Dibromofluoromethane (Surr)	*101*		*70 - 130*

Lab Sample ID: MB 480-213304/7
Matrix: Water
Analysis Batch: 213304

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			11/11/14 12:50	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			11/11/14 12:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*11/11/14 12:50*	*1*

Method: 8260C - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 480-213304/7
Matrix: Water
Analysis Batch: 213304

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		70 - 130		11/11/14 12:50	1
Toluene-d8 (Surr)	93		70 - 130		11/11/14 12:50	1
Dibromofluoromethane (Surr)	104		70 - 130		11/11/14 12:50	1

Lab Sample ID: LCS 480-213304/4
Matrix: Water
Analysis Batch: 213304

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,4-Trimethyl-1-pentene	25.0	23.7		ug/L		95	70 - 130
2,4,4-Trimethyl-2-pentene	25.0	34.6	*	ug/L		139	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	108		70 - 130
4-Bromofluorobenzene (Surr)	105		70 - 130
Toluene-d8 (Surr)	97		70 - 130
Dibromofluoromethane (Surr)	101		70 - 130

Lab Sample ID: LCSD 480-213304/5
Matrix: Water
Analysis Batch: 213304

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene	25.0	21.8		ug/L		87	70 - 130	8	20
2,4,4-Trimethyl-2-pentene	25.0	32.5		ug/L		130	70 - 130	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		70 - 130
4-Bromofluorobenzene (Surr)	104		70 - 130
Toluene-d8 (Surr)	95		70 - 130
Dibromofluoromethane (Surr)	99		70 - 130

Lab Sample ID: MB 480-214574/7
Matrix: Water
Analysis Batch: 214574

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			11/18/14 00:22	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			11/18/14 00:22	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		70 - 130		11/18/14 00:22	1
4-Bromofluorobenzene (Surr)	103		70 - 130		11/18/14 00:22	1
Toluene-d8 (Surr)	89		70 - 130		11/18/14 00:22	1
Dibromofluoromethane (Surr)	97		70 - 130		11/18/14 00:22	1

Method: 8260C - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 480-214574/4
Matrix: Water
Analysis Batch: 214574

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4,4-Trimethyl-1-pentene			12.5	24.9	*	ug/L		200	70 - 130		
2,4,4-Trimethyl-2-pentene			12.5	34.5	*	ug/L		276	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*93*		*70 - 130*
Dibromofluoromethane (Surr)	*90*		*70 - 130*

Lab Sample ID: LCSD 480-214574/5
Matrix: Water
Analysis Batch: 214574

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene			12.5	22.0	*	ug/L		176	70 - 130	12	20
2,4,4-Trimethyl-2-pentene			12.5	33.2	*	ug/L		266	70 - 130	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 130*
4-Bromofluorobenzene (Surr)	*109*		*70 - 130*
Toluene-d8 (Surr)	*93*		*70 - 130*
Dibromofluoromethane (Surr)	*91*		*70 - 130*

Lab Sample ID: 480-70789-1 MS
Matrix: Ground Water
Analysis Batch: 214574

Client Sample ID: OC-GW-16R
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 130*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*
Dibromofluoromethane (Surr)	*94*		*70 - 130*

Lab Sample ID: 480-70789-1 MSD
Matrix: Ground Water
Analysis Batch: 214574

Client Sample ID: OC-GW-16R
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 130*
4-Bromofluorobenzene (Surr)	*109*		*70 - 130*
Toluene-d8 (Surr)	*96*		*70 - 130*
Dibromofluoromethane (Surr)	*94*		*70 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-155974/21-A
Matrix: Water
Analysis Batch: 157145

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 155974

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		5.0	0.31	ug/L		11/11/14 08:44	11/18/14 09:09	1
Bis(2-ethylhexyl) phthalate	ND		2.0	1.7	ug/L		11/11/14 08:44	11/18/14 09:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*74*		*30 - 130*	*11/11/14 08:44*	*11/18/14 09:09*	*1*
Terphenyl-d14	*81*		*30 - 130*	*11/11/14 08:44*	*11/18/14 09:09*	*1*
Nitrobenzene-d5	*79*		*30 - 130*	*11/11/14 08:44*	*11/18/14 09:09*	*1*

Lab Sample ID: LCS 240-155974/22-A
Matrix: Water
Analysis Batch: 157145

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 155974

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
N-Nitrosodiphenylamine			40.0	31.0		ug/L		77	40 - 140		
Bis(2-ethylhexyl) phthalate			20.0	15.4		ug/L		77	40 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*75*		*30 - 130*
Terphenyl-d14	*75*		*30 - 130*
Nitrobenzene-d5	*77*		*30 - 130*

Lab Sample ID: LCSD 240-155974/23-A
Matrix: Water
Analysis Batch: 157145

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 155974

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-Nitrosodiphenylamine			40.0	30.8		ug/L		77	40 - 140	1	20
Bis(2-ethylhexyl) phthalate			20.0	15.3		ug/L		76	40 - 140	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*73*		*30 - 130*
Terphenyl-d14	*73*		*30 - 130*
Nitrobenzene-d5	*78*		*30 - 130*

Lab Sample ID: 480-70789-1 MS
Matrix: Ground Water
Analysis Batch: 157145

Client Sample ID: OC-GW-16R
Prep Type: Total/NA
Prep Batch: 155974

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
N-Nitrosodiphenylamine	88		39.6	107		ug/L		49	40 - 140		
Bis(2-ethylhexyl) phthalate	ND		19.8	6.84	F1	ug/L		35	40 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*57*		*30 - 130*
Terphenyl-d14	*40*		*30 - 130*
Nitrobenzene-d5	*61*		*30 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 480-70789-1 MSD
Matrix: Ground Water
Analysis Batch: 157145

Client Sample ID: OC-GW-16R
Prep Type: Total/NA
Prep Batch: 155974

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-Nitrosodiphenylamine	88		38.5	39.1	F1 F2	ug/L		-126	40 - 140	93	20
Bis(2-ethylhexyl) phthalate	ND		19.2	5.91	F1	ug/L		31	40 - 140	15	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*60*		*30 - 130*
Terphenyl-d14	*38*		*30 - 130*
Nitrobenzene-d5	*61*		*30 - 130*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 480-212445/7
Matrix: Water
Analysis Batch: 212445

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			11/06/14 13:56	1
Ethylbenzene	ND		1.0	0.25	ug/L			11/06/14 13:56	1
Methyl tert-butyl ether	0.551	J	1.0	0.25	ug/L			11/06/14 13:56	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			11/06/14 13:56	1
Naphthalene	ND		1.0	0.25	ug/L			11/06/14 13:56	1
o-Xylene	ND		1.0	0.25	ug/L			11/06/14 13:56	1
Toluene	ND		1.0	0.25	ug/L			11/06/14 13:56	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 13:56	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			11/06/14 13:56	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			11/06/14 13:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*95*		*73 - 144*		*11/06/14 13:56*	*1*
2,5-Dibromotoluene (pid)	*98*		*81 - 132*		*11/06/14 13:56*	*1*

Lab Sample ID: LCS 480-212445/8
Matrix: Water
Analysis Batch: 212445

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5.00	5.06		ug/L		101	70 - 130
Ethylbenzene	5.00	5.06		ug/L		101	70 - 130
Methyl tert-butyl ether	5.00	4.10		ug/L		82	70 - 130
m-Xylene & p-Xylene	10.0	10.1		ug/L		101	70 - 130
Naphthalene	5.00	4.79		ug/L		96	70 - 130
o-Xylene	5.00	5.14		ug/L		103	70 - 130
Toluene	5.00	5.03		ug/L		101	70 - 130
C5-C8 Aliphatics	15.0	14.1		ug/L		94	70 - 130
C9-C10 Aromatics	5.00	4.98	J	ug/L		100	70 - 130
C9-C12 Aliphatics	15.0	14.8		ug/L		99	70 - 130

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 480-212445/8
Matrix: Water
Analysis Batch: 212445

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,5-Dibromotoluene (fid)	99		73 - 144
2,5-Dibromotoluene (pid)	101		81 - 132

Lab Sample ID: LCSD 480-212445/9
Matrix: Water
Analysis Batch: 212445

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	5.00	5.04		ug/L		101	70 - 130	0	25
Ethylbenzene	5.00	4.99		ug/L		100	70 - 130	1	25
Methyl tert-butyl ether	5.00	4.27		ug/L		85	70 - 130	4	25
m-Xylene & p-Xylene	10.0	10.0		ug/L		100	70 - 130	0	25
Naphthalene	5.00	4.68		ug/L		94	70 - 130	2	25
o-Xylene	5.00	5.11		ug/L		102	70 - 130	1	25
Toluene	5.00	5.01		ug/L		100	70 - 130	0	25
C5-C8 Aliphatics	15.0	13.9		ug/L		93	70 - 130	1	25
C9-C10 Aromatics	5.00	4.97	J	ug/L		99	70 - 130	0	25
C9-C12 Aliphatics	15.0	15.0		ug/L		100	70 - 130	1	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,5-Dibromotoluene (fid)	98		73 - 144
2,5-Dibromotoluene (pid)	100		81 - 132

Lab Sample ID: 480-70789-1 MS
Matrix: Ground Water
Analysis Batch: 212445

Client Sample ID: OC-GW-16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	2.5		5.68	9.30		ug/L		120	70 - 130
Ethylbenzene	1.8		5.68	8.77		ug/L		122	70 - 130
Methyl tert-butyl ether	2.6	B	5.68	8.81		ug/L		110	70 - 130
m-Xylene & p-Xylene	ND		11.4	12.0		ug/L		105	70 - 130
Naphthalene	ND		5.68	7.01		ug/L		123	70 - 130
o-Xylene	ND		5.68	8.91	F1	ug/L		157	70 - 130
Toluene	12		5.68	18.5		ug/L		122	70 - 130
C5-C8 Aliphatics	510		17.0	534	4	ug/L		158	70 - 130
C9-C10 Aromatics	23		5.68	30.7	4	ug/L		128	70 - 130
C9-C12 Aliphatics	51		17.0	88.7	F1	ug/L		222	70 - 130

Surrogate	MS %Recovery	MS Qualifier	Limits
2,5-Dibromotoluene (fid)	143		73 - 144
2,5-Dibromotoluene (pid)	128		81 - 132

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 480-70789-1 MSD
Matrix: Ground Water
Analysis Batch: 212445

Client Sample ID: OC-GW-16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	2.5		5.68	9.33		ug/L		120	70 - 130	0	50
Ethylbenzene	1.8		5.68	8.83		ug/L		124	70 - 130	1	50
Methyl tert-butyl ether	2.6	B	5.68	7.81		ug/L		92	70 - 130	12	50
m-Xylene & p-Xylene	ND		11.4	11.8		ug/L		104	70 - 130	1	50
Naphthalene	ND		5.68	6.99		ug/L		123	70 - 130	0	50
o-Xylene	ND		5.68	9.09	F1	ug/L		160	70 - 130	2	50
Toluene	12		5.68	18.8		ug/L		128	70 - 130	2	50
C5-C8 Aliphatics	510		17.0	534	4	ug/L		159	70 - 130	0	50
C9-C10 Aromatics	23		5.68	30.8	4	ug/L		128	70 - 130	0	50
C9-C12 Aliphatics	51		17.0	92.2	F1	ug/L		242	70 - 130	4	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*142*		*73 - 144*
2,5-Dibromotoluene (pid)	*127*		*81 - 132*

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-212462/1-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	19	ug/L		11/06/14 11:35	11/07/14 22:37	1

Lab Sample ID: LCS 480-212462/2-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10000	9810		ug/L		98	80 - 120

Lab Sample ID: LCSD 480-212462/3-A
Matrix: Water
Analysis Batch: 212903

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 212462

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	10000	9730		ug/L		97	80 - 120	1	20

Lab Sample ID: 480-70789-1 MS
Matrix: Ground Water
Analysis Batch: 212903

Client Sample ID: OC-GW-16R
Prep Type: Dissolved
Prep Batch: 212462

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	2100		10000	11600		ug/L		95	75 - 125

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 480-70789-1 MSD — **Client Sample ID: OC-GW-16R**
Matrix: Ground Water — **Prep Type: Dissolved**
Analysis Batch: 212903 — **Prep Batch: 212462**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	2100		10000	11700		ug/L		96	75 - 125	1	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-213234/2-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213234**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.147	J	0.20	0.10	mg/L		11/11/14 00:22	11/11/14 10:29	1

Lab Sample ID: LCS 480-213234/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213234**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.04		mg/L		104	90 - 110

Lab Sample ID: 480-70789-1 MS — **Client Sample ID: OC-GW-16R**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213234**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	4.2	B	0.500	6.10	4	mg/L		386	90 - 110

Lab Sample ID: 480-70789-1 MSD — **Client Sample ID: OC-GW-16R**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213234**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	4.2	B	0.500	5.70	4	mg/L		306	90 - 110	7	20

Lab Sample ID: MB 480-213236/2-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213236**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		11/11/14 00:26	11/11/14 10:31	1

Lab Sample ID: LCS 480-213236/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 213373 — **Prep Batch: 213236**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.897		mg/L		90	90 - 110

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: 480-70789-6 MS
Matrix: Ground Water
Analysis Batch: 213373

Client Sample ID: OC-IW-6
Prep Type: Total/NA
Prep Batch: 213236

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia	0.67		0.500	0.928	F1	mg/L		51	90 - 110		

Lab Sample ID: MB 480-213449/2-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 213449

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.122	J	0.20	0.10	mg/L		11/11/14 19:58	11/12/14 18:49	1

Lab Sample ID: LCS 480-213449/1-A
Matrix: Water
Analysis Batch: 213731

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 213449

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia			1.00	1.10		mg/L		110	90 - 110		

Method: 9040C - pH

Lab Sample ID: 480-70789-1 DU
Matrix: Ground Water
Analysis Batch: 99488

Client Sample ID: OC-GW-16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.24	HF		6.340		SU				2	20

GC/MS VOA

Analysis Batch: 213205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-8	TRIP BLANK	Total/NA	Water	8260C	
LCS 480-213205/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-213205/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-213205/7	Method Blank	Total/NA	Water	8260C	

Analysis Batch: 213304

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	8260C	
480-70789-2	OC-B-03	Total/NA	Ground Water	8260C	
480-70789-3	OC-GW-101	Total/NA	Ground Water	8260C	
480-70789-4	OC-GW-13	Total/NA	Ground Water	8260C	
480-70789-5	OC-IW-10	Total/NA	Ground Water	8260C	
480-70789-6	OC-IW-6	Total/NA	Ground Water	8260C	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	8260C	
LCS 480-213304/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-213304/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-213304/7	Method Blank	Total/NA	Water	8260C	

Analysis Batch: 214574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	8260C	
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	8260C	
LCS 480-214574/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-214574/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-214574/7	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 155974

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	3510C	
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	3510C	
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	3510C	
480-70789-2	OC-B-03	Total/NA	Ground Water	3510C	
480-70789-3	OC-GW-101	Total/NA	Ground Water	3510C	
480-70789-4	OC-GW-13	Total/NA	Ground Water	3510C	
480-70789-5	OC-IW-10	Total/NA	Ground Water	3510C	
480-70789-6	OC-IW-6	Total/NA	Ground Water	3510C	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	3510C	
LCS 240-155974/22-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-155974/23-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-155974/21-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 157145

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	8270D	155974
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	8270D	155974
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	8270D	155974
480-70789-2	OC-B-03	Total/NA	Ground Water	8270D	155974
480-70789-3	OC-GW-101	Total/NA	Ground Water	8270D	155974

GC/MS Semi VOA (Continued)

Analysis Batch: 157145 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-4	OC-GW-13	Total/NA	Ground Water	8270D	155974
480-70789-5	OC-IW-10	Total/NA	Ground Water	8270D	155974
480-70789-6	OC-IW-6	Total/NA	Ground Water	8270D	155974
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	8270D	155974
LCS 240-155974/22-A	Lab Control Sample	Total/NA	Water	8270D	155974
LCSD 240-155974/23-A	Lab Control Sample Dup	Total/NA	Water	8270D	155974
MB 240-155974/21-A	Method Blank	Total/NA	Water	8270D	155974

GC VOA

Analysis Batch: 212445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	MAVPH	
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	MAVPH	
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	MAVPH	
480-70789-2	OC-B-03	Total/NA	Ground Water	MAVPH	
480-70789-3	OC-GW-101	Total/NA	Ground Water	MAVPH	
480-70789-4	OC-GW-13	Total/NA	Ground Water	MAVPH	
480-70789-5	OC-IW-10	Total/NA	Ground Water	MAVPH	
480-70789-6	OC-IW-6	Total/NA	Ground Water	MAVPH	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	MAVPH	
480-70789-8	TRIP BLANK	Total/NA	Water	MAVPH	
LCS 480-212445/8	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 480-212445/9	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 480-212445/7	Method Blank	Total/NA	Water	MAVPH	

Analysis Batch: 212831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	MA VPH	
480-70789-2	OC-B-03	Total/NA	Ground Water	MA VPH	
480-70789-3	OC-GW-101	Total/NA	Ground Water	MA VPH	
480-70789-4	OC-GW-13	Total/NA	Ground Water	MA VPH	
480-70789-5	OC-IW-10	Total/NA	Ground Water	MA VPH	
480-70789-6	OC-IW-6	Total/NA	Ground Water	MA VPH	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	MA VPH	
480-70789-8	TRIP BLANK	Total/NA	Water	MA VPH	

Metals

Prep Batch: 212462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Dissolved	Ground Water	3005A	
480-70789-1 MS	OC-GW-16R	Dissolved	Ground Water	3005A	
480-70789-1 MSD	OC-GW-16R	Dissolved	Ground Water	3005A	
480-70789-2	OC-B-03	Dissolved	Ground Water	3005A	
480-70789-3	OC-GW-101	Dissolved	Ground Water	3005A	
480-70789-4	OC-GW-13	Dissolved	Ground Water	3005A	
480-70789-5	OC-IW-10	Dissolved	Ground Water	3005A	
480-70789-6	OC-IW-6	Dissolved	Ground Water	3005A	
480-70789-7	OC-GW-16R DUP	Dissolved	Ground Water	3005A	

Metals (Continued)

Prep Batch: 212462 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-212462/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-212462/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-212462/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 212903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Dissolved	Ground Water	6010	212462
480-70789-1 MS	OC-GW-16R	Dissolved	Ground Water	6010	212462
480-70789-1 MSD	OC-GW-16R	Dissolved	Ground Water	6010	212462
480-70789-2	OC-B-03	Dissolved	Ground Water	6010	212462
480-70789-3	OC-GW-101	Dissolved	Ground Water	6010	212462
480-70789-4	OC-GW-13	Dissolved	Ground Water	6010	212462
480-70789-5	OC-IW-10	Dissolved	Ground Water	6010	212462
480-70789-6	OC-IW-6	Dissolved	Ground Water	6010	212462
480-70789-7	OC-GW-16R DUP	Dissolved	Ground Water	6010	212462
LCS 480-212462/2-A	Lab Control Sample	Total Recoverable	Water	6010	212462
LCSD 480-212462/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	212462
MB 480-212462/1-A	Method Blank	Total Recoverable	Water	6010	212462

General Chemistry

Analysis Batch: 99488

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	9040C	
480-70789-1 DU	OC-GW-16R	Total/NA	Ground Water	9040C	
480-70789-2	OC-B-03	Total/NA	Ground Water	9040C	
480-70789-3	OC-GW-101	Total/NA	Ground Water	9040C	
480-70789-4	OC-GW-13	Total/NA	Ground Water	9040C	
480-70789-5	OC-IW-10	Total/NA	Ground Water	9040C	
480-70789-6	OC-IW-6	Total/NA	Ground Water	9040C	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	9040C	
LCS 360-99488/1	Lab Control Sample	Total/NA	Water	9040C	

Prep Batch: 213234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	Distill/Ammonia	
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	Distill/Ammonia	
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-213234/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-213234/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 213236

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-2	OC-B-03	Total/NA	Ground Water	Distill/Ammonia	
480-70789-3	OC-GW-101	Total/NA	Ground Water	Distill/Ammonia	
480-70789-4	OC-GW-13	Total/NA	Ground Water	Distill/Ammonia	
480-70789-6	OC-IW-6	Total/NA	Ground Water	Distill/Ammonia	
480-70789-6 MS	OC-IW-6	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-213236/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-213236/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

General Chemistry (Continued)

Analysis Batch: 213373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-1	OC-GW-16R	Total/NA	Ground Water	350.1	213234
480-70789-1 MS	OC-GW-16R	Total/NA	Ground Water	350.1	213234
480-70789-1 MSD	OC-GW-16R	Total/NA	Ground Water	350.1	213234
480-70789-2	OC-B-03	Total/NA	Ground Water	350.1	213236
480-70789-3	OC-GW-101	Total/NA	Ground Water	350.1	213236
480-70789-4	OC-GW-13	Total/NA	Ground Water	350.1	213236
480-70789-6	OC-IW-6	Total/NA	Ground Water	350.1	213236
480-70789-6 MS	OC-IW-6	Total/NA	Ground Water	350.1	213236
LCS 480-213234/1-A	Lab Control Sample	Total/NA	Water	350.1	213234
LCS 480-213236/1-A	Lab Control Sample	Total/NA	Water	350.1	213236
MB 480-213234/2-A	Method Blank	Total/NA	Water	350.1	213234
MB 480-213236/2-A	Method Blank	Total/NA	Water	350.1	213236

Prep Batch: 213449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-5	OC-IW-10	Total/NA	Ground Water	Distill/Ammonia	
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-213449/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 213731

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70789-5	OC-IW-10	Total/NA	Ground Water	350.1	213449
480-70789-7	OC-GW-16R DUP	Total/NA	Ground Water	350.1	213449
LCS 480-213449/1-A	Lab Control Sample	Total/NA	Water	350.1	213449
MB 480-213449/2-A	Method Blank	Total/NA	Water	350.1	213449

Client Sample ID: OC-GW-16R

Lab Sample ID: 480-70789-1

Date Collected: 11/05/14 08:25

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	213304	11/11/14 16:06	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		2	157145	11/18/14 15:00	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 15:51	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 22:46	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213234	11/11/14 00:22	RS	TAL BUF
Total/NA	Analysis	350.1		5	213373	11/11/14 11:29	KMF	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 14:57	RWE	TAL WFD

Client Sample ID: OC-B-03

Lab Sample ID: 480-70789-2

Date Collected: 11/05/14 09:10

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	213304	11/11/14 16:32	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		1	157145	11/18/14 14:36	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 17:46	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:08	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213236	11/11/14 00:26	RS	TAL BUF
Total/NA	Analysis	350.1		1	213373	11/11/14 11:09	KMF	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:05	RWE	TAL WFD

Client Sample ID: OC-GW-101

Lab Sample ID: 480-70789-3

Date Collected: 11/05/14 10:55

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		4	213304	11/11/14 16:56	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		2.5	157145	11/18/14 16:10	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 18:24	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:30	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213236	11/11/14 00:26	RS	TAL BUF
Total/NA	Analysis	350.1		1	213373	11/11/14 11:10	KMF	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:09	RWE	TAL WFD

Client Sample ID: OC-GW-13

Lab Sample ID: 480-70789-4

Date Collected: 11/05/14 13:17

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	213304	11/11/14 17:21	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		1	157145	11/18/14 13:50	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 19:03	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:11	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213236	11/11/14 00:26	RS	TAL BUF
Total/NA	Analysis	350.1		1	213373	11/11/14 11:11	KMF	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:17	RWE	TAL WFD

Client Sample ID: OC-IW-10

Lab Sample ID: 480-70789-5

Date Collected: 11/05/14 10:50

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	213304	11/11/14 17:47	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		1	157145	11/18/14 14:13	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 20:19	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:14	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		50	213731	11/12/14 18:54	RS	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:21	RWE	TAL WFD

Client Sample ID: OC-IW-6

Lab Sample ID: 480-70789-6

Date Collected: 11/05/14 11:15

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	213304	11/11/14 18:12	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		1	157145	11/18/14 13:26	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 20:58	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:16	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213236	11/11/14 00:26	RS	TAL BUF
Total/NA	Analysis	350.1		1	213373	11/11/14 11:14	KMF	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:25	RWE	TAL WFD

Client Sample ID: OC-GW-16R DUP

Lab Sample ID: 480-70789-7

Date Collected: 11/05/14 08:25

Matrix: Ground Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	213304	11/11/14 18:38	GTG	TAL BUF
Total/NA	Prep	3510C			155974	11/11/14 08:44	MG	TAL CAN
Total/NA	Analysis	8270D		1	157145	11/18/14 16:33	JMG	TAL CAN
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 21:36	DLE	TAL BUF
Dissolved	Prep	3005A			212462	11/06/14 11:35	LED	TAL BUF
Dissolved	Analysis	6010		1	212903	11/07/14 23:19	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			213449	11/11/14 19:58	RS	TAL BUF
Total/NA	Analysis	350.1		5	213731	11/12/14 18:54	RS	TAL BUF
Total/NA	Analysis	9040C		1	99488	11/07/14 15:29	RWE	TAL WFD

Client Sample ID: TRIP BLANK

Lab Sample ID: 480-70789-8

Date Collected: 11/05/14 00:00

Matrix: Water

Date Received: 11/06/14 02:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	213205	11/11/14 02:56	LCH	TAL BUF
Total/NA	Analysis	MA VPH		1	212831	11/07/14 15:51	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	212445	11/06/14 22:15	DLE	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Iron
8260C		Ground Water	2,4,4-Trimethyl-1-pentene
8260C		Ground Water	2,4,4-Trimethyl-2-pentene
8260C		Water	2,4,4-Trimethyl-1-pentene
8260C		Water	2,4,4-Trimethyl-2-pentene
MAVPH		Ground Water	Benzene
MAVPH		Ground Water	C5-C8 Aliphatics
MAVPH		Ground Water	C9-C10 Aromatics
MAVPH		Ground Water	C9-C12 Aliphatics
MAVPH		Ground Water	Ethylbenzene
MAVPH		Ground Water	Methyl tert-butyl ether
MAVPH		Ground Water	m-Xylene & p-Xylene
MAVPH		Ground Water	Naphthalene
MAVPH		Ground Water	o-Xylene
MAVPH		Ground Water	Toluene
MAVPH		Water	Benzene
MAVPH		Water	C5-C8 Aliphatics
MAVPH		Water	C9-C10 Aromatics
MAVPH		Water	C9-C12 Aliphatics
MAVPH		Water	Ethylbenzene
MAVPH		Water	Methyl tert-butyl ether
MAVPH		Water	m-Xylene & p-Xylene
MAVPH		Water	Naphthalene
MAVPH		Water	o-Xylene
MAVPH		Water	Toluene

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-15
Connecticut	State Program	1	PH-0590	12-31-14
Florida	NELAP	4	E87225	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200004	07-31-15
Kansas	NELAP	7	E-10336	01-31-15
Kentucky (UST)	State Program	4	58	06-30-15
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-14
Nevada	State Program	9	OH-000482008A	07-31-15
New Jersey	NELAP	2	OH001	06-30-15
New York	NELAP	2	10975	03-31-15
Ohio VAP	State Program	5	CL0024	10-31-15
Pennsylvania	NELAP	3	68-00340	08-31-15
Texas	NELAP	6		08-31-15
USDA	Federal		P330-13-00319	11-26-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Laboratory: TestAmerica Canton (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460175	09-14-15
Washington	State Program	10	C971	01-12-15
West Virginia DEP	State Program	3	210	12-31-14
Wisconsin	State Program	5	999518190	08-31-15

Laboratory: TestAmerica Westfield

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0494	09-30-16
Massachusetts	State Program	1	M-MA014	06-30-15
New Hampshire	NELAP	1	2539	08-08-15

Method Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL BUF
8270D	Semivolatile Organic Compounds (GC/MS)	MA DEP	TAL CAN
MA VPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
6010	Metals (ICP)	SW846	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
9040C	pH	SW846	TAL WFD

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Plant B

TestAmerica Job ID: 480-70789-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70789-1	OC-GW-16R	Ground Water	11/05/14 08:25	11/06/14 02:00
480-70789-2	OC-B-03	Ground Water	11/05/14 09:10	11/06/14 02:00
480-70789-3	OC-GW-101	Ground Water	11/05/14 10:55	11/06/14 02:00
480-70789-4	OC-GW-13	Ground Water	11/05/14 13:17	11/06/14 02:00
480-70789-5	OC-IW-10	Ground Water	11/05/14 10:50	11/06/14 02:00
480-70789-6	OC-IW-6	Ground Water	11/05/14 11:15	11/06/14 02:00
480-70789-7	OC-GW-16R DUP	Ground Water	11/05/14 08:25	11/06/14 02:00
480-70789-8	TRIP BLANK	Water	11/05/14 00:00	11/06/14 02:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70789-1

Login Number: 70789

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	Refer to job narrative for details
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp.
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	True	Yes: Samples checked, no residual chlorine detected

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: SAUNA IACOZZI / BRIAN GUICHARD	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56531-11111.1
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Olin Wilington Annual GW Event Desc: Plant B quarterly(March/M	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - VPH	8260MCP - VOC TMPs	8270_LL_MCP - SVOC NDPA/BEHP	SM4500_H+ - pH	8260MCP - (MOD) Custom 8260 MCP Analyte List	Total Number of containers
				Preservation Code:	X	X	S	D	A	A	N	N	A	
~~OC-GW-16R~~				~~Water~~										
~~OC-_____MS~~				~~Water~~										
~~OC-_____MSD~~				~~Water~~										
~~OC-_____DUP~~				~~Water~~										
OC-B-03	11-5-14	9:10	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-GW-101	11-5-14	10:55	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-GW-13	11-5-14	13:17	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-10	11-5-14	10:50	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-6	11-5-14	11:55	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
				Water										
				Water										

Special Instructions/Note:

480-70789 Chain of Custody

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 11-5-14 13:20	Company	Received by: [signature]	Date/Time: 11-5-14 1320	Company
Relinquished by: [signature]	Date/Time: 11-5-14 1650	Company	Received by: [signature]	Date/Time: 11/06/14 0200	Company TA
Relinquished by: [signature]	Date/Time: 11/6/14 1700	Company	Received by: [signature]	Date/Time: 11-7-14 1040	Company CAL
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 3.3 2.4 #1		

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: SAUNA IACOZZI BRIAN GUICHARD	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56531-11111.1
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Company: Olin Corporation				Job #:
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0020			
Email: jmcashwell@olin.com	WO #:			
Project Name: Olin Wilington Annual GW Event Desc: Plant B quarterly(March/M	Project #: 48006612			
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L - EDA	Z - other (specify)

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Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - VPH	8260MCP - VOC TMPs	8270_LL_MCP - SVOC NDPA/BEHP	SM4500_H+ - pH	8260MCP - (MOD) Custom 8260 MCP Analyte List	Total Number of containers
				Preservation Code:			S	D	A	A	N	N	A	
~~OC-GW-16R~~				~~Water~~										
~~OC-_____MS~~				~~Water~~										
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OC-B-03	11-5-14	9:10	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-GW-101	11-5-14	10:55	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-GW-13	11-5-14	13:17	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-10	11-5-14	10:50	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-6	11-5-14	11:55	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
				Water										
				Water										

Special Instructions/Note:

480-70789 Chain of Custody

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Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	11-5-14 13:20		[signature]	11-5-14 1320	
[signature]	11-5-14 1650		[signature]	11/06/14 0200	TA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.3 2.4#1

11/20/2014

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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Site: Massachusetts	SSOW#:			

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Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - VPH	8260MCP - VOC TMPs	8270_LL_MCP - SVOC NDPA/BEHP	SM4500_H+ - pH	8260MCP - (MOD) Custom 8260 MCP Analyte List	Total Number of containers
			Preservation Code:				S	D	A	A	N	N	A	
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OC-GW-13	11-5-14	13:17	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-10	11-5-14	10:50	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
OC-IW-6	11-5-14	11:55	G	Water	✓		✓	✓	✓	✓	✓	✓	✓	11
				Water										
				Water										

Special Instructions/Note:

480-70789 Chain of Custody

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

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Special Instructions/QC Requirements:

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Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	11-5-14 13:20		[signature]	11-5-14 1320	
[signature]	11-5-14 1650		[signature]	11/06/14 0200	TA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.3 2.4#1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-81081-1
Client Project/Site: Olin Chemical Wilmington MA

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
6/5/2015 4:14:38 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Job ID: 480-81081-1

Laboratory: TestAmerica Buffalo

Narrative

Comments
Due to the dilutions required, per question G on the MassDEP Analytical Protocol Certification Form, the CAM reporting limits specified in this CAM protocol could not be achieved for some or all samples/analytes.

Receipt
The sample was received on 5/28/2015 at 2:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

GC/MS VOA
Method 8260C: At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: OC-GW-16R (480-81081-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC VOA
Method MAVPH: The following sample was diluted due to the abundance of non-target analytes: OC-GW-16R (480-81081-1). Elevated reporting limits (RLs) are provided.

Method MAVPH: The following samples were diluted to bring the concentration of target analytes within the calibration range: (480-81150-A-9 MS) and (480-81150-A-9 MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 9040C: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following sample(s) has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 245685.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-81081-1**

Project Location: **Olin Chemical Wilmington MA** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-81081-1 [1]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ■	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ■	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☐ Yes ■ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	■ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 6/5/15 15:58

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Client Sample ID: OC-GW-16R

Lab Sample ID: 480-81081-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1700		20	8.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	510		20	8.6	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine	1.5	J	5.3	0.074	ug/L	1		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	1200		500	150	ug/L	100		MA VPH	Total/NA
C5-C8 Aliphatics	1200		500	150	ug/L	100		MAVPH	Total/NA
Iron	1900		50	19	ug/L	1		6010	Dissolved
Ammonia	3.7		1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.09	HF	0.100	0.100	SU	1		9040C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-16R

Date Collected: 05/27/15 08:35
Date Received: 05/28/15 02:30

Lab Sample ID: 480-81081-1

Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	**1700**		20	8.0	ug/L			06/02/15 14:41	20
2,4,4-Trimethyl-2-pentene	**510**		20	8.6	ug/L			06/02/15 14:41	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*06/02/15 14:41*	*20*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*06/02/15 14:41*	*20*
Toluene-d8 (Surr)	*94*		*70 - 130*		*06/02/15 14:41*	*20*
Dibromofluoromethane (Surr)	*98*		*70 - 130*		*06/02/15 14:41*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	**1.5**	**J**	5.3	0.074	ug/L		06/02/15 10:18	06/04/15 19:23	1
Bis(2-ethylhexyl) phthalate	ND		5.3	0.44	ug/L		06/02/15 10:18	06/04/15 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*86*		*15 - 110*	*06/02/15 10:18*	*06/04/15 19:23*	*1*
Nitrobenzene-d5	*66*		*30 - 130*	*06/02/15 10:18*	*06/04/15 19:23*	*1*
Phenol-d5	*30*		*15 - 110*	*06/02/15 10:18*	*06/04/15 19:23*	*1*
2-Fluorobiphenyl	*70*		*30 - 130*	*06/02/15 10:18*	*06/04/15 19:23*	*1*
p-Terphenyl-d14	*93*		*30 - 130*	*06/02/15 10:18*	*06/04/15 19:23*	*1*
2-Fluorophenol	*43*		*15 - 110*	*06/02/15 10:18*	*06/04/15 19:23*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	**1200**		500	150	ug/L			06/01/15 17:04	100
C9-C12 Aliphatics (adjusted)	ND		500	150	ug/L			06/01/15 17:04	100

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		100	25	ug/L			06/01/15 16:19	100
Ethylbenzene	ND		100	25	ug/L			06/01/15 16:19	100
Methyl tert-butyl ether	ND		100	25	ug/L			06/01/15 16:19	100
m-Xylene & p-Xylene	ND		200	50	ug/L			06/01/15 16:19	100
Naphthalene	ND		100	25	ug/L			06/01/15 16:19	100
o-Xylene	ND		100	25	ug/L			06/01/15 16:19	100
Toluene	ND		100	25	ug/L			06/01/15 16:19	100
C5-C8 Aliphatics	**1200**		500	150	ug/L			06/01/15 16:19	100
C9-C10 Aromatics	ND		500	50	ug/L			06/01/15 16:19	100
C9-C12 Aliphatics	ND		500	150	ug/L			06/01/15 16:19	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*97*		*73 - 144*		*06/01/15 16:19*	*100*
2,5-Dibromotoluene (pid)	*91*		*81 - 132*		*06/01/15 16:19*	*100*

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**1900**		50	19	ug/L		05/28/15 11:30	05/28/15 22:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**3.7**		1.0	0.50	mg/L		05/29/15 08:07	05/29/15 12:41	5

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Client Sample ID: OC-GW-16R
Date Collected: 05/27/15 08:35
Date Received: 05/28/15 02:30

Lab Sample ID: 480-81081-1
Matrix: Ground Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.09	HF	0.100	0.100	SU			05/28/15 09:00	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
480-81081-1	OC-GW-16R	93	102	94	98

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
LCS 480-245640/14	Lab Control Sample	89	105	92	95
LCSD 480-245640/13	Lab Control Sample Dup	92	105	93	96
MB 480-245640/15	Method Blank	90	101	92	93

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Ground Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	NBZ	PHL	FBP	TPH	2FP
Lab Sample ID	Client Sample ID	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)	(15-110)
480-81081-1	OC-GW-16R	86	66	30	70	93	43

Surrogate Legend

TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
FBP = 2-Fluorobiphenyl
TPH = p-Terphenyl-d14
2FP = 2-Fluorophenol

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	NBZ	PHL	FBP	TPH	2FP
Lab Sample ID	Client Sample ID	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)	(15-110)
LCS 480-245685/2-A	Lab Control Sample	80	77	35	78	95	49
LCSD 480-245685/3-A	Lab Control Sample Dup	76	73	34	75	94	48
MB 480-245685/1-A	Method Blank	35	74	35	80	102	50

Surrogate Legend

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
FBP = 2-Fluorobiphenyl
TPH = p-Terphenyl-d14
2FP = 2-Fluorophenol

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Ground Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	25DBT2 (73-144)	25DBT1 (81-132)								
480-81081-1	OC-GW-16R	97	91								

Surrogate Legend
25DBT = 2,5-Dibromotoluene (fid)

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	25DBT2 (73-144)	25DBT1 (81-132)								
LCS 480-245448/4	Lab Control Sample	95	91								
LCSD 480-245448/5	Lab Control Sample Dup	94	88								
MB 480-245448/3	Method Blank	95	90								

Surrogate Legend
25DBT = 2,5-Dibromotoluene (fid)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 480-245640/15
Matrix: Water
Analysis Batch: 245640

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			06/02/15 12:20	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			06/02/15 12:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*		*06/02/15 12:20*	*1*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*06/02/15 12:20*	*1*
Toluene-d8 (Surr)	*92*		*70 - 130*		*06/02/15 12:20*	*1*
Dibromofluoromethane (Surr)	*93*		*70 - 130*		*06/02/15 12:20*	*1*

Lab Sample ID: LCS 480-245640/14
Matrix: Water
Analysis Batch: 245640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,4-Trimethyl-1-pentene	25.0	23.9		ug/L		95	70 - 130
2,4,4-Trimethyl-2-pentene	25.0	24.2		ug/L		97	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*92*		*70 - 130*
Dibromofluoromethane (Surr)	*95*		*70 - 130*

Lab Sample ID: LCSD 480-245640/13
Matrix: Water
Analysis Batch: 245640

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene	25.0	25.2		ug/L		101	70 - 130	5	20
2,4,4-Trimethyl-2-pentene	25.0	25.4		ug/L		102	70 - 130	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*93*		*70 - 130*
Dibromofluoromethane (Surr)	*96*		*70 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Lab Sample ID: MB 480-245685/1-A
Matrix: Water
Analysis Batch: 246199

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245685

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		5.0	0.070	ug/L		06/02/15 10:18	06/04/15 17:54	1
Bis(2-ethylhexyl) phthalate	ND		5.0	0.42	ug/L		06/02/15 10:18	06/04/15 17:54	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

Lab Sample ID: MB 480-245685/1-A
Matrix: Water
Analysis Batch: 246199

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245685

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	35		15 - 110	06/02/15 10:18	06/04/15 17:54	1
Nitrobenzene-d5	74		30 - 130	06/02/15 10:18	06/04/15 17:54	1
Phenol-d5	35		15 - 110	06/02/15 10:18	06/04/15 17:54	1
2-Fluorobiphenyl	80		30 - 130	06/02/15 10:18	06/04/15 17:54	1
p-Terphenyl-d14	102		30 - 130	06/02/15 10:18	06/04/15 17:54	1
2-Fluorophenol	50		15 - 110	06/02/15 10:18	06/04/15 17:54	1

Lab Sample ID: LCS 480-245685/2-A
Matrix: Water
Analysis Batch: 246199

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245685

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodiphenylamine	8.00	6.69		ug/L		84	40 - 140
Bis(2-ethylhexyl) phthalate	4.00	3.91	J	ug/L		98	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	80		15 - 110
Nitrobenzene-d5	77		30 - 130
Phenol-d5	35		15 - 110
2-Fluorobiphenyl	78		30 - 130
p-Terphenyl-d14	95		30 - 130
2-Fluorophenol	49		15 - 110

Lab Sample ID: LCSD 480-245685/3-A
Matrix: Water
Analysis Batch: 246199

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 245685

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-Nitrosodiphenylamine	8.00	6.48		ug/L		81	40 - 140	3	20
Bis(2-ethylhexyl) phthalate	4.00	4.05	J	ug/L		101	40 - 140	4	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol	76		15 - 110
Nitrobenzene-d5	73		30 - 130
Phenol-d5	34		15 - 110
2-Fluorobiphenyl	75		30 - 130
p-Terphenyl-d14	94		30 - 130
2-Fluorophenol	48		15 - 110

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 480-245448/3
Matrix: Water
Analysis Batch: 245448

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			06/01/15 10:19	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 480-245448/3
Matrix: Water
Analysis Batch: 245448

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		1.0	0.25	ug/L			06/01/15 10:19	1
Methyl tert-butyl ether	ND		1.0	0.25	ug/L			06/01/15 10:19	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			06/01/15 10:19	1
Naphthalene	ND		1.0	0.25	ug/L			06/01/15 10:19	1
o-Xylene	ND		1.0	0.25	ug/L			06/01/15 10:19	1
Toluene	ND		1.0	0.25	ug/L			06/01/15 10:19	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			06/01/15 10:19	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			06/01/15 10:19	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			06/01/15 10:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*95*		*73 - 144*		*06/01/15 10:19*	*1*
2,5-Dibromotoluene (pid)	*90*		*81 - 132*		*06/01/15 10:19*	*1*

Lab Sample ID: LCS 480-245448/4
Matrix: Water
Analysis Batch: 245448

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5.00	4.89		ug/L		98	70 - 130
Ethylbenzene	5.00	5.00		ug/L		100	70 - 130
Methyl tert-butyl ether	5.00	4.74		ug/L		95	70 - 130
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	70 - 130
Naphthalene	5.00	4.76		ug/L		95	70 - 130
o-Xylene	5.00	5.20		ug/L		104	70 - 130
Toluene	5.00	4.99		ug/L		100	70 - 130
C5-C8 Aliphatics	15.0	15.9		ug/L		106	70 - 130
C9-C10 Aromatics	5.00	5.14		ug/L		103	70 - 130
C9-C12 Aliphatics	15.0	16.0		ug/L		107	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*95*		*73 - 144*
2,5-Dibromotoluene (pid)	*91*		*81 - 132*

Lab Sample ID: LCSD 480-245448/5
Matrix: Water
Analysis Batch: 245448

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	5.00	4.78		ug/L		96	70 - 130	2	25
Ethylbenzene	5.00	4.89		ug/L		98	70 - 130	2	25
Methyl tert-butyl ether	5.00	4.73		ug/L		95	70 - 130	0	25
m-Xylene & p-Xylene	10.0	9.81		ug/L		98	70 - 130	4	25
Naphthalene	5.00	4.71		ug/L		94	70 - 130	1	25
o-Xylene	5.00	5.10		ug/L		102	70 - 130	2	25
Toluene	5.00	4.87		ug/L		97	70 - 130	2	25
C5-C8 Aliphatics	15.0	14.9		ug/L		100	70 - 130	6	25
C9-C10 Aromatics	5.00	4.97	J	ug/L		99	70 - 130	3	25

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 480-245448/5
Matrix: Water
Analysis Batch: 245448

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C9-C12 Aliphatics			15.0	15.5		ug/L		103	70 - 130	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*94*		*73 - 144*
2,5-Dibromotoluene (pid)	*88*		*81 - 132*

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-244887/1-A
Matrix: Water
Analysis Batch: 245090

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 244887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	19	ug/L		05/28/15 11:30	05/28/15 22:00	1

Lab Sample ID: LCS 480-244887/2-A
Matrix: Water
Analysis Batch: 245090

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 244887

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Iron			10000	10100		ug/L		101	80 - 120		

Lab Sample ID: LCSD 480-244887/3-A
Matrix: Water
Analysis Batch: 245090

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 244887

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron			10000	9770		ug/L		98	80 - 120	3	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-245071/2-A
Matrix: Water
Analysis Batch: 245179

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245071

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		05/29/15 08:07	05/29/15 11:25	1

Lab Sample ID: LCS 480-245071/1-A
Matrix: Water
Analysis Batch: 245179

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245071

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia			1.00	0.993		mg/L		99	90 - 110		

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

GC/MS VOA

Analysis Batch: 245640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	8260C	
LCS 480-245640/14	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-245640/13	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-245640/15	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 245685

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	3510C	
LCS 480-245685/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 480-245685/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 480-245685/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 246199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	8270D	245685
LCS 480-245685/2-A	Lab Control Sample	Total/NA	Water	8270D	245685
LCSD 480-245685/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	245685
MB 480-245685/1-A	Method Blank	Total/NA	Water	8270D	245685

GC VOA

Analysis Batch: 244506

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	MA VPH	

Analysis Batch: 245448

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	MAVPH	
LCS 480-245448/4	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 480-245448/5	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 480-245448/3	Method Blank	Total/NA	Water	MAVPH	

Metals

Prep Batch: 244887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Dissolved	Ground Water	3005A	
LCS 480-244887/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-244887/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-244887/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 245090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Dissolved	Ground Water	6010	244887
LCS 480-244887/2-A	Lab Control Sample	Total Recoverable	Water	6010	244887
LCSD 480-244887/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	244887
MB 480-244887/1-A	Method Blank	Total Recoverable	Water	6010	244887

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

General Chemistry

Analysis Batch: 244894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	9040C	
LCS 480-244894/1	Lab Control Sample	Total/NA	Water	9040C	

Prep Batch: 245071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-245071/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-245071/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 245179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-245071/1-A	Lab Control Sample	Total/NA	Water	350.1	245071
MB 480-245071/2-A	Method Blank	Total/NA	Water	350.1	245071

Analysis Batch: 245188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-81081-1	OC-GW-16R	Total/NA	Ground Water	350.1	245071

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Client Sample ID: OC-GW-16R

Date Collected: 05/27/15 08:35
Date Received: 05/28/15 02:30

Lab Sample ID: 480-81081-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	245640	06/02/15 14:41	GTG	TAL BUF
Total/NA	Prep	3510C			245685	06/02/15 10:18	MCZ	TAL BUF
Total/NA	Analysis	8270D		1	246199	06/04/15 19:23	DMR	TAL BUF
Total/NA	Analysis	MA VPH		100	244506	06/01/15 17:04	GSR	TAL BUF
Total/NA	Analysis	MAVPH		100	245448	06/01/15 16:19	AJM	TAL BUF
Dissolved	Prep	3005A			244887	05/28/15 11:30	TAS	TAL BUF
Dissolved	Analysis	6010		1	245090	05/28/15 22:39	AMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			245071	05/29/15 08:07	ELR	TAL BUF
Total/NA	Analysis	350.1		5	245188	05/29/15 12:41	KMF	TAL BUF
Total/NA	Analysis	9040C		1	244894	05/28/15 09:00	MGH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Iron
8260C		Ground Water	2,4,4-Trimethyl-1-pentene
8260C		Ground Water	2,4,4-Trimethyl-2-pentene
8270D	3510C	Ground Water	Bis(2-ethylhexyl) phthalate
8270D	3510C	Ground Water	N-Nitrosodiphenylamine
9040C		Ground Water	pH
MA VPH		Ground Water	C5-C8 Aliphatics (adjusted)
MA VPH		Ground Water	C9-C12 Aliphatics (adjusted)
MAVPH		Ground Water	Benzene
MAVPH		Ground Water	C5-C8 Aliphatics
MAVPH		Ground Water	C9-C10 Aromatics
MAVPH		Ground Water	C9-C12 Aliphatics
MAVPH		Ground Water	Ethylbenzene
MAVPH		Ground Water	Methyl tert-butyl ether
MAVPH		Ground Water	m-Xylene & p-Xylene
MAVPH		Ground Water	Naphthalene
MAVPH		Ground Water	o-Xylene
MAVPH		Ground Water	Toluene

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL BUF
8270D	Semivolatile Organic Compounds (GC/MS) Low Level	MA DEP	TAL BUF
MA VPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
6010	Metals (ICP)	SW846	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
9040C	pH	SW846	TAL BUF

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-81081-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-81081-1	OC-GW-16R	Ground Water	05/27/15 08:35	05/28/15 02:30

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-81081-1

Login Number: 81081

List Source: TestAmerica Buffalo

List Number: 1

Creator: Williams, Christopher S

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OLIN
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-67680-12290.1
Client Contact: Mr. Brian Guichard	Phone: 9785586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:

Address: 51 Eames street	Due Date Requested:
City: Wilmington	TAT Requested (days):
State, Zip: MA, 01887	
Phone: 423-336-4012(Tel)	PO #: REWI0025
Email: beguichard@olin.com	WO #:
Project Name: Plant B Quarterly Event Desc: Plant B quarterly(March/May/Augu	Project #: 48006612
Site: Massachusetts	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	6010MCP - Iron	MAVPH - MA VPH	8260MCP - TMP 8260	8270_LL_MCP - NDPA/BEHP 8270LL	SM4500_H+ - pH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	A	N	N		
OC-GW-16R	5-27-15	8:35	G	Water	✓		✓	✓	✓	✓	✓	✓	11	

480-81081 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	BRIAN GUICHARD	5-27-15			5-27-15 1250	TA
2		5-27-15 1800	TA		28MAY15 0220	TAS
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 0.9 #1

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6/5/2015

June 25, 2015

To: James Cashwell
From: Chris Ricardi
Subject: Interim Response Steps Work Plan Slurry Wall Monitoring
Annual Sediment – November 2014

DATA VALIDATION REPORT
NOVEMBER 2014 SLURRY WALL / CAP MONITORING SEDIMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Set: 480-70791-1

1.0 INTRODUCTION

Sediment samples were collected from the Olin Chemical Superfund Site on November 3, 2014. Samples were analyzed by TestAmerica Laboratories in Buffalo, New York. Data were reported in sample delivery group (SDG) 480-70791-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed by the following USEPA SW-846 (USEPA, 1996) method:

- total metals (aluminum, chromium and iron) by USEPA Method 6010C in sediment

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. Data validation actions are summarized on Table 3.

With the exception of the data qualification items discussed in the sections below, results are determined to be usable as reported by the laboratory.

2.0 METALS

Data were reviewed for the following parameters:

Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
Matrix Spike Analysis
* Field Duplicate Results
Detection Limits

* = indicates that criteria were met for this parameter

<u>Data Completeness</u>

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

Continued…

The chain of custody (COC) submitted to the lab with these samples lacked sample date and time. Sample collection information was supplied to the lab after sample receipt.

Matrix Spike / Matrix Spike Duplicate Analysis

Sample OC-SD-SD5 was analyzed as a matrix spike (MS) for total metals. Percent recoveries for aluminum (183 on the matrix spike and 164 in the matrix spike duplicate) and iron (147 in the matrix spike and 149 in the matrix spike duplicate) were outside the 75-125 control limits. Positive detections of aluminum and iron were reported in all samples of SDG 480-70791-1 and concentration results were qualified estimated (J) in samples OC-SD-SD5 and its field duplicate, OC-SD DUP 1. Qualified results are summarized in Table 3 and were assigned qualification reason code MS-H.

Detection Limits

Aluminum quantitation limits were reported (5.3-6.6 mg/kg) above the project goal of 2.5 mg/kg; all associated results are positive detections above the project goal.

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.

Chris Ricardi

6/25/15

Chris Ricardi, NRCC-EAC
Senior Chemist

Date

Michael J Murphy

6/25/2015

Michael Murphy
Project Principal

Date

Continued…

REFERENCES:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

USEPA, 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary
Data Validation Report
November 2014 Slurry Wall / Cap Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

Slurry Wall Cap					**Method Class**	Metals	Moisture/Solids
					Analysis Method	SW6010	E160.3
					Fraction	T	T
SDG	**Location**	**Sample ID**	**Sample Date**	**Media**	**Qc Code**	Param_Count	Param_Count
480-70791-1	SD-SD1	OC-SD-SD1	11/3/2014	SED	FS	3	2
480-70791-1	SD-SD2	OC-SD-SD2	11/3/2014	SED	FS	3	2
480-70791-1	SD-SD3	OC-SD-SD3	11/3/2014	SED	FS	3	2
480-70791-1	SD-SD4	OC-SD-SD4	11/3/2014	SED	FS	3	2
480-70791-1	SD-SD5	OC-SD DUP 1	11/3/2014	SED	FD	3	2
480-70791-1	SD-SD5	OC-SD-SD5	11/3/2014	SED	FS	3	2

Notes:

Number listed under method indicates number of target analytes reported.

FS = Field Sample

FD = Field Duplicate

SED = Sediment

T = Total fraction

Created by: BJS 6/18/15

Checked by: KMS 6/23/15

Table 2
Final Results Summary
Data Validation Report
November 2014 Slurry Wall / Cap Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		480-70791-1		480-70791-1		480-70791-1		480-70791-1		480-70791-1		480-70791-1	
		Location		SD-SD1		SD-SD2		SD-SD3		SD-SD4		SD-SD5		SD-SD5	
		Field Sample Date		11/3/2014		11/3/2014		11/3/2014		11/3/2014		11/3/2014		11/3/2014	
		Field Sample ID		OC-SD-SD1		OC-SD-SD2		OC-SD-SD3		OC-SD-SD4		OC-SD DUP 1		OC-SD-SD5	
		Qc Code		FS		FS		FS		FS		FD		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
E160.3	T	Percent Moisture	percent	25		28		22		25		34		36	
E160.3	T	Percent Solids	percent	75		72		78		75		66		64	
SW6010	T	Aluminum	mg/kg	8,700		5,200		5,600		6,800		7,400	J	7,000	J
SW6010	T	Chromium	mg/kg	15		190		32		14		480		410	
SW6010	T	Iron	mg/kg	9,800		7,100		7,800		7,900		6,200	J	5,900	J

Notes:

T = Total

FS = field sample

FD = field duplicate

U = not detected, value is the quantitation limit

J = value is estimated

mg/kg = milligrams per kilogram

Created by: KMS 6/23/15

Checked by: CSR 6/23/15

Table 3
Validation Qualification Action Summary
Data Validation Report
November 2014 Slurry Wall / Cap Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Analysis Method	Lab Sample ID	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validated Qualifier	Val Reason Code	Result Units	Lab ID
480-70791-1	SW6010	480-70791-5	OC-SD-SD5	Aluminum	7000		7,000	J	MS-H	mg/kg	TALBFLO
480-70791-1	SW6010	480-70791-5	OC-SD-SD5	Iron	5900	B	5,900	J	MS-H	mg/kg	TALBFLO
480-70791-1	SW6010	480-70791-6	OC-SD DUP 1	Aluminum	7400		7,400	J	MS-H	mg/kg	TALBFLO
480-70791-1	SW6010	480-70791-6	OC-SD DUP 1	Iron	6200	B	6,200	J	MS-H	mg/kg	TALBFLO

Validation Reason Codes:

MS-H = MS and/or MSD recovery high

Created by: KMS 6/23/15

Checked by: CSR 6/25/15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-70791-1
Client Project/Site: Olin Chemical Annual Sediment
Sampling Event: Sediment Annual

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/12/2014 2:23:31 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery exceeds the control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Job ID: 480-70791-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 11/6/2014 at 2:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2º C.

Receipt Exceptions
The Chain of Custody (COC) form and sample containers did not list a date or time of collection. A date of 11/03/2014 and default time of 00:00 was used for sample login.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-70791-1**

Project Location: **Olin Chemical Annual Sediment** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-70791-1 [1-6]

Matrices: ☐ Groundwater/Surface Water ■ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	■ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 11/12/14 14:20

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Client Sample ID: OC-SD-SD1 — Lab Sample ID: 480-70791-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	15		0.64	0.25	mg/Kg	1	☼	6010	Total/NA
Aluminum	8700		13	5.6	mg/Kg	1	☼	6010	Total/NA
Iron	9800	B	13	1.4	mg/Kg	1	☼	6010	Total/NA

Client Sample ID: OC-SD-SD2 — Lab Sample ID: 480-70791-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	190		0.66	0.26	mg/Kg	1	☼	6010	Total/NA
Aluminum	5200		13	5.8	mg/Kg	1	☼	6010	Total/NA
Iron	7100	B	13	1.5	mg/Kg	1	☼	6010	Total/NA

Client Sample ID: OC-SD-SD3 — Lab Sample ID: 480-70791-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	32		0.60	0.24	mg/Kg	1	☼	6010	Total/NA
Aluminum	5600		12	5.3	mg/Kg	1	☼	6010	Total/NA
Iron	7800	B	12	1.3	mg/Kg	1	☼	6010	Total/NA

Client Sample ID: OC-SD-SD4 — Lab Sample ID: 480-70791-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	14		0.63	0.25	mg/Kg	1	☼	6010	Total/NA
Aluminum	6800		13	5.5	mg/Kg	1	☼	6010	Total/NA
Iron	7900	B	13	1.4	mg/Kg	1	☼	6010	Total/NA

Client Sample ID: OC-SD-SD5 — Lab Sample ID: 480-70791-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	410		0.72	0.29	mg/Kg	1	☼	6010	Total/NA
Aluminum	7000		14	6.3	mg/Kg	1	☼	6010	Total/NA
Iron	5900	B	14	1.6	mg/Kg	1	☼	6010	Total/NA

Client Sample ID: OC-SD DUP 1 — Lab Sample ID: 480-70791-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	480		0.75	0.30	mg/Kg	1	☼	6010	Total/NA
Aluminum	7400		15	6.6	mg/Kg	1	☼	6010	Total/NA
Iron	6200	B	15	1.6	mg/Kg	1	☼	6010	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-SD-SD1

Lab Sample ID: 480-70791-1
Date Collected: 11/03/14 14:10
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 75.5

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	15		0.64	0.25	mg/Kg	☼	11/06/14 11:48	11/07/14 21:25	1
Aluminum	8700		13	5.6	mg/Kg	☼	11/06/14 11:48	11/07/14 21:25	1
Iron	9800	B	13	1.4	mg/Kg	☼	11/06/14 11:48	11/07/14 21:25	1

Client Sample ID: OC-SD-SD2

Lab Sample ID: 480-70791-2
Date Collected: 11/03/14 13:30
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 72.5

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	190		0.66	0.26	mg/Kg	☼	11/06/14 11:48	11/07/14 21:28	1
Aluminum	5200		13	5.8	mg/Kg	☼	11/06/14 11:48	11/07/14 21:28	1
Iron	7100	B	13	1.5	mg/Kg	☼	11/06/14 11:48	11/07/14 21:28	1

Client Sample ID: OC-SD-SD3

Lab Sample ID: 480-70791-3
Date Collected: 11/03/14 13:15
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 77.9

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	32		0.60	0.24	mg/Kg	☼	11/06/14 11:48	11/07/14 21:30	1
Aluminum	5600		12	5.3	mg/Kg	☼	11/06/14 11:48	11/07/14 21:30	1
Iron	7800	B	12	1.3	mg/Kg	☼	11/06/14 11:48	11/07/14 21:30	1

Client Sample ID: OC-SD-SD4

Lab Sample ID: 480-70791-4
Date Collected: 11/03/14 13:45
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 75.4

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	14		0.63	0.25	mg/Kg	☼	11/06/14 11:48	11/07/14 21:33	1
Aluminum	6800		13	5.5	mg/Kg	☼	11/06/14 11:48	11/07/14 21:33	1
Iron	7900	B	13	1.4	mg/Kg	☼	11/06/14 11:48	11/07/14 21:33	1

Client Sample ID: OC-SD-SD5

Lab Sample ID: 480-70791-5
Date Collected: 11/03/14 13:00
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 64.1

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	410		0.72	0.29	mg/Kg	☼	11/06/14 11:48	11/07/14 21:36	1
Aluminum	7000		14	6.3	mg/Kg	☼	11/06/14 11:48	11/07/14 21:36	1
Iron	5900	B	14	1.6	mg/Kg	☼	11/06/14 11:48	11/07/14 21:36	1

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Client Sample ID: OC-SD DUP 1
Date Collected: 11/03/14 00:00
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70791-6
Matrix: Sediment
Percent Solids: 65.6

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	480		0.75	0.30	mg/Kg	☼	11/06/14 11:48	11/07/14 21:57	1
Aluminum	7400		15	6.6	mg/Kg	☼	11/06/14 11:48	11/07/14 21:57	1
Iron	6200	B	15	1.6	mg/Kg	☼	11/06/14 11:48	11/07/14 21:57	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-212473/1-A
Matrix: Solid
Analysis Batch: 212912

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 212473

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.48	0.19	mg/Kg		11/06/14 11:48	11/07/14 21:01	1
Aluminum	ND		9.6	4.2	mg/Kg		11/06/14 11:48	11/07/14 21:01	1
Iron	1.29	J	9.6	1.1	mg/Kg		11/06/14 11:48	11/07/14 21:01	1

Lab Sample ID: LCDSRM 480-212473/3-A
Matrix: Solid
Analysis Batch: 212912

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 212473

Analyte			Spike Added	LCDSRM Result	LCDSRM Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			117	103		mg/Kg		88.0	69.7 - 129.9	4	30
Aluminum			8720	7630		mg/Kg		87.6	41.6 - 157.9	4	30
Iron			12300	9660		mg/Kg		78.8	30.5 - 169.9	1	30

Lab Sample ID: LCSSRM 480-212473/2-A
Matrix: Solid
Analysis Batch: 212912

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 212473

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium			115	98.2		mg/Kg		85.4	69.7 - 129.9
Aluminum			8590	7910		mg/Kg		92.1	41.6 - 157.9
Iron			12100	9590		mg/Kg		79.4	30.5 - 169.9

Lab Sample ID: 480-70791-5 MS
Matrix: Sediment
Analysis Batch: 212912

Client Sample ID: OC-SD-SD5
Prep Type: Total/NA
Prep Batch: 212473

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	410		59.6	521	4	mg/Kg	☼	191	75 - 125
Aluminum	7000		2970	12400	F1	mg/Kg	☼	183	75 - 125
Iron	5900	B	2980	10300	F1	mg/Kg	☼	147	75 - 125

Lab Sample ID: 480-70791-5 MSD
Matrix: Sediment
Analysis Batch: 212912

Client Sample ID: OC-SD-SD5
Prep Type: Total/NA
Prep Batch: 212473

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	410		62.5	444	4	mg/Kg	☼	60	75 - 125	16	35
Aluminum	7000		3120	12100	F1	mg/Kg	☼	164	75 - 125	3	35
Iron	5900	B	3120	10600	F1	mg/Kg	☼	149	75 - 125	3	35

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Metals

Prep Batch: 212473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70791-1	OC-SD-SD1	Total/NA	Sediment	3050B	
480-70791-2	OC-SD-SD2	Total/NA	Sediment	3050B	
480-70791-3	OC-SD-SD3	Total/NA	Sediment	3050B	
480-70791-4	OC-SD-SD4	Total/NA	Sediment	3050B	
480-70791-5	OC-SD-SD5	Total/NA	Sediment	3050B	
480-70791-5 MS	OC-SD-SD5	Total/NA	Sediment	3050B	
480-70791-5 MSD	OC-SD-SD5	Total/NA	Sediment	3050B	
480-70791-6	OC-SD DUP 1	Total/NA	Sediment	3050B	
LCDSRM 480-212473/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 480-212473/2-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 480-212473/1-A	Method Blank	Total/NA	Solid	3050B	

Analysis Batch: 212912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70791-1	OC-SD-SD1	Total/NA	Sediment	6010	212473
480-70791-2	OC-SD-SD2	Total/NA	Sediment	6010	212473
480-70791-3	OC-SD-SD3	Total/NA	Sediment	6010	212473
480-70791-4	OC-SD-SD4	Total/NA	Sediment	6010	212473
480-70791-5	OC-SD-SD5	Total/NA	Sediment	6010	212473
480-70791-5 MS	OC-SD-SD5	Total/NA	Sediment	6010	212473
480-70791-5 MSD	OC-SD-SD5	Total/NA	Sediment	6010	212473
480-70791-6	OC-SD DUP 1	Total/NA	Sediment	6010	212473
LCDSRM 480-212473/3-A	Lab Control Sample Dup	Total/NA	Solid	6010	212473
LCSSRM 480-212473/2-A	Lab Control Sample	Total/NA	Solid	6010	212473
MB 480-212473/1-A	Method Blank	Total/NA	Solid	6010	212473

General Chemistry

Analysis Batch: 213121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70791-1	OC-SD-SD1	Total/NA	Sediment	Moisture	
480-70791-2	OC-SD-SD2	Total/NA	Sediment	Moisture	
480-70791-3	OC-SD-SD3	Total/NA	Sediment	Moisture	
480-70791-4	OC-SD-SD4	Total/NA	Sediment	Moisture	
480-70791-5	OC-SD-SD5	Total/NA	Sediment	Moisture	
480-70791-5 MS	OC-SD-SD5	Total/NA	Sediment	Moisture	
480-70791-5 MSD	OC-SD-SD5	Total/NA	Sediment	Moisture	
480-70791-6	OC-SD DUP 1	Total/NA	Sediment	Moisture	

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Client Sample ID: OC-SD-SD1

Lab Sample ID: 480-70791-1
Date Collected: 11/03/14 14:10
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 75.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:25	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Client Sample ID: OC-SD-SD2

Lab Sample ID: 480-70791-2
Date Collected: 11/03/14 13:30
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 72.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:28	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Client Sample ID: OC-SD-SD3

Lab Sample ID: 480-70791-3
Date Collected: 11/03/14 13:15
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:30	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Client Sample ID: OC-SD-SD4

Lab Sample ID: 480-70791-4
Date Collected: 11/03/14 13:45
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 75.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:33	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Client Sample ID: OC-SD-SD5

Lab Sample ID: 480-70791-5
Date Collected: 11/03/14 13:00
Matrix: Sediment
Date Received: 11/06/14 02:00
Percent Solids: 64.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:36	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Client Sample ID: OC-SD DUP 1
Date Collected: 11/03/14 00:00
Date Received: 11/06/14 02:00

Lab Sample ID: 480-70791-6
Matrix: Sediment
Percent Solids: 65.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			212473	11/06/14 11:48	EJT	TAL BUF
Total/NA	Analysis	6010		1	212912	11/07/14 21:57	LMH	TAL BUF
Total/NA	Analysis	Moisture		1	213121	11/10/14 11:42	ZJR	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
Moisture	Percent Moisture	EPA	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Annual Sediment

TestAmerica Job ID: 480-70791-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70791-1	OC-SD-SD1	Sediment	11/03/14 14:10	11/06/14 02:00
480-70791-2	OC-SD-SD2	Sediment	11/03/14 13:30	11/06/14 02:00
480-70791-3	OC-SD-SD3	Sediment	11/03/14 13:15	11/06/14 02:00
480-70791-4	OC-SD-SD4	Sediment	11/03/14 13:45	11/06/14 02:00
480-70791-5	OC-SD-SD5	Sediment	11/03/14 13:00	11/06/14 02:00
480-70791-6	OC-SD DUP 1	Sediment	11/03/14 00:00	11/06/14 02:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70791-1

Login Number: 70791

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	Refer to job narrative for details
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	Refer to job narrative for details
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp.
Samples received within 48 hours of sampling.	False	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Chris MAZolini	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-56530-11110.1
Client Contact: Mr. Brian Guichard	Phone: 9786586121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:

Address: 51 Eames street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Wilmington	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887			
Phone: 423-336-4012(Tel)	PO #: REWI0020		Other:
Email: beguichard@olin.com	WO #:		
Project Name: Olin Chemical Annual Sediment	Project #: 48006612		
Site: Massachusetts	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010MCP - (MOD) 6010 MCP Analyte list	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
OC-SD1	11-3-14	13:10	G	Solid					
OC-SD2	11-3-14	13:30	G	Solid					
OC-SD3	11-3-14	13:45	G	Solid					
OC-SD4	11-3-14	13:45	G	Solid					
OC-SD5	11-3-14	13:00	G	Solid					
OC-SD5 -MS				Solid					
OC-SD5 -MSD				Solid					
OC-SD DUP 1				Solid					

480-70791 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11-5-14 1320			11/5/14 1320	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	11/5/14 1650			11/06/14 0200	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.2 #1

Page 17 of 17

11/12/2014

July 7, 2015

To: James Cashwell
From: Chris Ricardi
Subject: 51 Eames Street Property Plant B
Quarterly Groundwater April 2015

DATA VALIDATION REPORT
APRIL 2015 PLANT B QUARTERLY GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Set 480-78414-1

1.0 INTRODUCTION

A groundwater sample was collected from monitoring well GW-16R on April 14, 2015 as specified for Plant B monitoring quarterly sampling in the Interim Response Step Work Plan (IRSWP) [MACTEC, 2007]. The sample was analyzed by TestAmerica Laboratories in Buffalo, New York. Data were reported in sample delivery group (SDG) 480-78414-1. A summary of the sample and analyses included in this review is contained in Table 1. The sample reviewed in this report was analyzed for the following USEPA SW-846 (USEPA, 1996), Standard Methods (APHA, 1995), or Massachusetts Department of Environmental Protection (MassDEP, 2004) methods:

- Trimethylpentenes by USEPA Method 8260C
- Bis(2-ethylhexyl)phthalate and N-nitrosodiphenylamine (NDPA) by USEPA Method 8270D
- Volatile Petroleum Hydrocarbons (VPH) by MassDEP VPH
- Dissolved Iron by USEPA Method 6010C
- Ammonia by USEPA Method 350.1 (Lachat 10-107-06-1)
- pH by USEPA Method 9040C

Results were reviewed using method performance goals identified in the Olin Wilmington IRSWP and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010]. The analytical package was reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of data validation actions and associated qualifier reason codes is presented on Table 3.

2.0 TRIMETHYLPENTENES

Target analytes include 2,4,4 trimethyl-1-pentene and 2,4,4 trimethyl-2-pentene. The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Surrogate Recovery

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

Laboratory Control Sample (LCS)
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** **=** indicates that criteria were met for this parameter

LCS

480-78414-1

2,4,4-Trimethyl-2-pentene had a percent recovery of 134 and was above the upper control limit of 130 in the LCS (480-237178/4) associated with sample OC GW-16R. The result for 2,4,4-trimethyl-2-pentene in sample OC GW-6R was qualified estimated (J) and assigned a reason code of LCS-H in Table 3.

3.0 BIS(2-ETHYLHEXYL)PHTHALATE AND NDPA

Target compounds include bis(2-ethylhexyl)phthalate and n-nitrosodiphenylamine (NDPA). The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Surrogate Recovery
* Laboratory Control Sample
  Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** **=** indicates that criteria were met for this parameter

Reporting Limits

SDG 480-78414-1

A dilution analysis was performed on sample OC-GW-16R (10X) due to elevated concentration of n-nitrosodiphenylamine. Bis(2-Ethylhexyl)phthalate was not detected and the result has an elevated reporting limit.

4.0 VOLATILE PETROLEUM HYDROCARBONS (VPH)

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Surrogate Recovery
* Laboratory Control Sample
  Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** **=** indicates that criteria were met for this parameter

Reporting Limits

SDG 480-78414-1

A 500x dilution analysis was performed on sample OC-GW-16R due to elevated target compounds. The C9-C12 aliphatic adjusted results are reported from the dilution run at and elevated reporting limit. However, the unadjusted C9-C12 aliphatic results are reported from the original sample run at a 1X dilution without elevated reporting limits. See Table 2 for analyte results.

5.0 METALS (DISSOLVED IRON)

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample
* MS/MSD
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** **=** indicates that criteria were met for this parameter

6.0 GENERAL CHEMISTRY – AMMONIA, pH

The data were evaluated based on the following parameters:

* Data Completeness
  Holding Time
* Blanks
* Laboratory Control Sample
* MS (ammonia only)
* Laboratory Duplicate (pH only)
* Detection/Reporting Limits
* Sample Result Verification/Electronic Evaluation Verification

***** **=** indicates that criteria were met for this parameter

Holding Time

SDG 480-78414-1

The hold time goal for pH is to analyze samples on the day they are collected. Sample analysis was completed one day after collection. The result for pH was qualified estimated (J) and assigned a reason code of HT in Table 3.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

7/7/15

Chris Ricardi, NRCC-EAC
Senior Chemist

Date

7/7/15

Michael Murphy
Project Principal

Date

REFERENCE:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW., Washington, D.C. 20005.

MACTEC, 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8, 2007.

Massachusetts Department of Environmental Protection (MassDEP), 2004. "Method for the Determination of Volatile Petroleum Hydrocarbons (VPH)"; Division of Environmental Analysis; Office of Research and Standards; Bureau of Waste Site Cleanup; Revision 1.1; May 2004.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July 2010.

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996 with revisions.

Table 1
Sample Summary
Data Validation Report
April 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG	Matrix	Media	Loc Name	Field Sample Date	Field Sample ID	Method Class Analysis Method Fraction Qc Code	Ammonia E350.1 T	VPH MAVPH N	Metals SW6010 D	VOCs SW8260C N	SVOCs SW8270 N	pH SW9040C T
480-78414-1	L	BW	QC	4/14/2015 0:00	OC TB	TB		12		2		
480-78414-1	L	GW	GW-16R	4/14/2015 8:25	OC GW-16R	FS	1	12	1	2	2	1

Notes:
Number listed under method indicates number of target analytes reported.

Created by/Date: KMS 7/7/15
Checked by/Date: TLC 7/7/15

Table 2
Final Results Summary
Data Validation Report
April 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		480-78414-1		480-78414-1	
		Loc Name		GW-16R		QC	
		Field Sample Date		4/14/2015 8:25		4/14/2015 0:00	
		Field Sample Id		OC GW-16R		OC TB	
		Qc Code		FS		TB	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier
SW8260C	N	2,4,4-Trimethyl-1-pentene	ug/l	1,800		1	U
SW8260C	N	2,4,4-Trimethyl-2-pentene	ug/l	660	J	1	U
E350.1	T	Ammonia	mg/l	4.6			
MAVPH	N	Benzene	ug/l	3.4		1	U
MAVPH	N	C5-C8 Aliphatics	ug/l	1,600	J	5	U
MAVPH	N	C5-C8 Aliphatics (unadj.)	ug/l	1,600	J	5	U
MAVPH	N	C9-C10 Aromatics (unadj.)	ug/l	22		5	U
MAVPH	N	C9-C12 Aliphatics	ug/l	2,500	U	5	U
MAVPH	N	C9-C12 Aliphatics (unadj.)	ug/l	83		5	U
MAVPH	N	Ethyl benzene	ug/l	3.1		1	U
MAVPH	N	Methyl Tertbutyl Ether	ug/l	0.32	J	1	U
MAVPH	N	Naphthalene	ug/l	1	U	1	U
MAVPH	N	Toluene	ug/l	25		1	U
MAVPH	N	Xylene, o	ug/l	1	U	1	U
MAVPH	N	Xylenes (m&p)	ug/l	2	U	2	U
SW6010	D	Iron	ug/l	2,100			
SW8270	N	Bis(2-Ethylhexyl)phthalate	ug/l	49	U		
SW8270	N	N-Nitrosodiphenylamine	ug/l	120			
SW9040C	T	pH	PH UNITS	6.57	J		

Notes:

N = normal

T = total

D = dissolved/filtered

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

Created by: KMS 7/7/2015

Checked by: TLC 7/7/2015

Table 3
Validation Qualification Action Summary
Data Validation Report
April 2015 Plant B Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Method	Lab Sample ID	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validated Qualifier	Val Reason Code	Result Units	Lab ID
480-78414-1	SW9040C	480-78414-1	OC GW-16R	pH	6.57	HF	6.57	J	HT	PH UNITS	TALBFLO
480-78414-1	SW8260C	480-78414-1	OC GW-16R	2,4,4-Trimethyl-2-pentene	660	* ^	660	J	LCS-H	ug/l	TALBFLO

Notes:
J = value is estimated
ug/l = microgram per liter

Validation Reason Codes:
HT = Holding time for prep or analysis exceeded
LCS-H = LCS recovery high

Created by: KMS 7/7/15
Checked by: TLC 7/7/2015

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-78414-1
Client Project/Site: Olin Chemical Wilmington Quarterly
Sampling Event: Groundwater Quarterly (March/August)

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
4/28/2015 11:04:22 AM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-78414-1

Laboratory: TestAmerica Buffalo

Narrative

Comments
Due to the dilutions required, per question G on the MassDEP Analytical Protocol Certification Form, the CAM reporting limits specified in this CAM protocol could not be achieved for some or all samples/analytes.

Receipt
The samples were received on 4/15/2015 at 1:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7º C.

GC/MS VOA
Method 8260C: At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 8260C: The continuing calibration verification (CCV) for 2,4,4, Trimethyl-2-pentene associated with batch 237178 recovered above the MCP upper control limit. MCP protocol allows for 20% of the target compounds to be outside the 20% difference but not over 40% difference.

Method 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: OC GW-16R (480-78414-1). Elevated reporting limits (RLs) are provided.

Method 8260C: The laboratory control sample (LCS) and / or the laboratory control sample duplicate (LCSD) for batch 237178 exceeded control limits for the following analyte: 2,4,4-Trimethyl-2-pentene. MCP protocol allows for 10% of the target compounds to be outside of the limits provided the recoveries are over 10%.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 8270D: The continuing calibration verification (CCV) analyzed in batch 237610 was outside the method criteria for the following analyte: N-Nitrosoodiphenylamine. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte is considered estimated.

Method 8270D: The following sample was diluted due to the nature of the sample matrix : OC GW-16R (480-78414-1). As such, surrogate recoveries are below the calibration range, and elevated reporting limits (RLs) are provided.

Method 8270D: The continuing calibration verification (CCV) analyzed in batch 237610 was outside the method criteria for the following analyte: N-Nitrosoodiphenylamine. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte is considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method MAVPH: The following sample was diluted to bring the concentration of target analytes within the calibration range: OC GW-16R (480-78414-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 9040C: This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The following sample has been qualified with the "HF" flag to indicate analysis was performed in the laboratory outside the 15 minute timeframe: OC

Job ID: 480-78414-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

GW-16R (480-78414-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 237381.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-78414-1**

Project Location: **Olin Chemical Wilmington Quarterly** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-78414-1 [1-2]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ■	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ■	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	■ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☐ Yes ■ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ■ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 4/28/15 10:48

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Client Sample ID: OC GW-16R — Lab Sample ID: 480-78414-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1800		20	8.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	660	* ^	20	8.6	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine	120		49	0.69	ug/L	10		8270D	Total/NA
C5-C8 Aliphatics (adjusted)	1600	J	2500	750	ug/L	500		MA VPH	Total/NA
Benzene	3.4		1.0	0.25	ug/L	1		MAVPH	Total/NA
Ethylbenzene	3.1		1.0	0.25	ug/L	1		MAVPH	Total/NA
Methyl tert-butyl ether	0.32	J	1.0	0.25	ug/L	1		MAVPH	Total/NA
Toluene	25		1.0	0.25	ug/L	1		MAVPH	Total/NA
C9-C10 Aromatics	22		5.0	0.50	ug/L	1		MAVPH	Total/NA
C9-C12 Aliphatics	83		5.0	1.5	ug/L	1		MAVPH	Total/NA
C5-C8 Aliphatics - DL	1600	J	2500	750	ug/L	500		MAVPH	Total/NA
Iron	2100		50	19	ug/L	1		6010	Dissolved
Ammonia	4.6		1.0	0.50	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.57	HF	0.100	0.100	SU	1		9040C	Total/NA

Client Sample ID: OC TB — Lab Sample ID: 480-78414-2

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Client Sample ID: OC GW-16R
Date Collected: 04/14/15 08:25
Date Received: 04/15/15 01:35

Lab Sample ID: 480-78414-1
Matrix: Ground Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	**1800**		20	8.0	ug/L			04/20/15 04:17	20
2,4,4-Trimethyl-2-pentene	**660**	* ^	20	8.6	ug/L			04/20/15 04:17	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*		*04/20/15 04:17*	*20*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*04/20/15 04:17*	*20*
Toluene-d8 (Surr)	*96*		*70 - 130*		*04/20/15 04:17*	*20*
Dibromofluoromethane (Surr)	*108*		*70 - 130*		*04/20/15 04:17*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	**120**		49	0.69	ug/L		04/20/15 15:05	04/22/15 01:04	10
Bis(2-ethylhexyl) phthalate	ND		49	4.1	ug/L		04/20/15 15:05	04/22/15 01:04	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*104*		*15 - 110*	*04/20/15 15:05*	*04/22/15 01:04*	*10*
Nitrobenzene-d5	*82*		*30 - 130*	*04/20/15 15:05*	*04/22/15 01:04*	*10*
Phenol-d5	*34*		*15 - 110*	*04/20/15 15:05*	*04/22/15 01:04*	*10*
2-Fluorobiphenyl	*90*		*30 - 130*	*04/20/15 15:05*	*04/22/15 01:04*	*10*
p-Terphenyl-d14	*95*		*30 - 130*	*04/20/15 15:05*	*04/22/15 01:04*	*10*
2-Fluorophenol	*43*		*15 - 110*	*04/20/15 15:05*	*04/22/15 01:04*	*10*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	**1600**	**J**	2500	750	ug/L			04/20/15 17:03	500
C9-C12 Aliphatics (adjusted)	ND		2500	750	ug/L			04/20/15 17:03	500

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**3.4**		1.0	0.25	ug/L			04/16/15 16:28	1
Ethylbenzene	**3.1**		1.0	0.25	ug/L			04/16/15 16:28	1
Methyl tert-butyl ether	**0.32**	**J**	1.0	0.25	ug/L			04/16/15 16:28	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			04/16/15 16:28	1
Naphthalene	ND		1.0	0.25	ug/L			04/16/15 16:28	1
o-Xylene	ND		1.0	0.25	ug/L			04/16/15 16:28	1
Toluene	**25**		1.0	0.25	ug/L			04/16/15 16:28	1
C9-C10 Aromatics	**22**		5.0	0.50	ug/L			04/16/15 16:28	1
C9-C12 Aliphatics	**83**		5.0	1.5	ug/L			04/16/15 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*116*		*73 - 144*		*04/16/15 16:28*	*1*
2,5-Dibromotoluene (pid)	*108*		*81 - 132*		*04/16/15 16:28*	*1*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics	**1600**	**J**	2500	750	ug/L			04/17/15 17:36	500

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**2100**		50	19	ug/L		04/16/15 12:05	04/17/15 20:46	1

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Client Sample ID: OC GW-16R

Lab Sample ID: 480-78414-1

Date Collected: 04/14/15 08:25

Matrix: Ground Water

Date Received: 04/15/15 01:35

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	4.6		1.0	0.50	mg/L		04/20/15 19:30	04/22/15 18:37	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.57	HF	0.100	0.100	SU			04/15/15 12:50	1

Client Sample ID: OC TB

Lab Sample ID: 480-78414-2

Date Collected: 04/14/15 00:00

Matrix: Water

Date Received: 04/15/15 01:35

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			04/20/15 04:41	1
2,4,4-Trimethyl-2-pentene	ND	*	1.0	0.43	ug/L			04/20/15 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*		*04/20/15 04:41*	*1*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*04/20/15 04:41*	*1*
Toluene-d8 (Surr)	*98*		*70 - 130*		*04/20/15 04:41*	*1*
Dibromofluoromethane (Surr)	*106*		*70 - 130*		*04/20/15 04:41*	*1*

Method: MA VPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			04/20/15 17:03	1
C9-C12 Aliphatics (adjusted)	ND		5.0	1.5	ug/L			04/20/15 17:03	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			04/16/15 15:11	1
Ethylbenzene	ND		1.0	0.25	ug/L			04/16/15 15:11	1
Methyl tert-butyl ether	ND		1.0	0.25	ug/L			04/16/15 15:11	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			04/16/15 15:11	1
Naphthalene	ND		1.0	0.25	ug/L			04/16/15 15:11	1
o-Xylene	ND		1.0	0.25	ug/L			04/16/15 15:11	1
Toluene	ND		1.0	0.25	ug/L			04/16/15 15:11	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			04/16/15 15:11	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			04/16/15 15:11	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			04/16/15 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*96*		*73 - 144*		*04/16/15 15:11*	*1*
2,5-Dibromotoluene (pid)	*93*		*81 - 132*		*04/16/15 15:11*	*1*

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Ground Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
480-78414-1	OC GW-16R	108	99	96	108

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
480-78414-2	OC TB	106	104	98	106
LCS 480-237178/4	Lab Control Sample	105	104	97	105
LCSD 480-237178/5	Lab Control Sample Dup	104	103	98	105
MB 480-237178/7	Method Blank	106	102	98	107

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Ground Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	NBZ	PHL	FBP	TPH	2FP
Lab Sample ID	Client Sample ID	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)	(15-110)
480-78414-1	OC GW-16R	104	82	34	90	95	43

Surrogate Legend

TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
FBP = 2-Fluorobiphenyl
TPH = p-Terphenyl-d14
2FP = 2-Fluorophenol

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	NBZ	PHL	FBP	TPH	2FP
Lab Sample ID	Client Sample ID	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)	(15-110)
LCS 480-237381/2-A	Lab Control Sample	84	77	34	81	95	46
LCSD 480-237381/3-A	Lab Control Sample Dup	88	86	35	86	97	49
MB 480-237381/1-A	Method Blank	70	76	29	83	99	39

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Surrogate Legend

TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
FBP = 2-Fluorobiphenyl
TPH = p-Terphenyl-d14
2FP = 2-Fluorophenol

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Ground Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)											
Lab Sample ID	Client Sample ID	25DBT2 (73-144)	25DBT1 (81-132)										
480-78414-1	OC GW-16R	116	108										

Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)											
Lab Sample ID	Client Sample ID	25DBT2 (73-144)	25DBT1 (81-132)										
480-78414-2	OC TB	96	93										
LCS 480-236551/4	Lab Control Sample	98	93										
LCS 480-236849/4	Lab Control Sample	105	100										
LCSD 480-236551/5	Lab Control Sample Dup	93	87										
LCSD 480-236849/5	Lab Control Sample Dup	103	95										
MB 480-236551/3	Method Blank	91	87										
MB 480-236849/3	Method Blank	102	95										

Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 480-237178/7
Matrix: Water
Analysis Batch: 237178

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			04/20/15 00:48	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			04/20/15 00:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*		*04/20/15 00:48*	*1*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*04/20/15 00:48*	*1*
Toluene-d8 (Surr)	*98*		*70 - 130*		*04/20/15 00:48*	*1*
Dibromofluoromethane (Surr)	*107*		*70 - 130*		*04/20/15 00:48*	*1*

Lab Sample ID: LCS 480-237178/4
Matrix: Water
Analysis Batch: 237178

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4,4-Trimethyl-1-pentene			25.0	31.1		ug/L		125	70 - 130		
2,4,4-Trimethyl-2-pentene			25.0	33.5	*	ug/L		134	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*
Dibromofluoromethane (Surr)	*105*		*70 - 130*

Lab Sample ID: LCSD 480-237178/5
Matrix: Water
Analysis Batch: 237178

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene			25.0	27.3		ug/L		109	70 - 130	13	20
2,4,4-Trimethyl-2-pentene			25.0	30.4		ug/L		122	70 - 130	10	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*
Dibromofluoromethane (Surr)	*105*		*70 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Lab Sample ID: MB 480-237381/1-A
Matrix: Water
Analysis Batch: 237610

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		5.0	0.070	ug/L		04/20/15 15:05	04/21/15 23:34	1
Bis(2-ethylhexyl) phthalate	ND		5.0	0.42	ug/L		04/20/15 15:05	04/21/15 23:34	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

Lab Sample ID: MB 480-237381/1-A
Matrix: Water
Analysis Batch: 237610

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237381

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	70		15 - 110	04/20/15 15:05	04/21/15 23:34	1
Nitrobenzene-d5	76		30 - 130	04/20/15 15:05	04/21/15 23:34	1
Phenol-d5	29		15 - 110	04/20/15 15:05	04/21/15 23:34	1
2-Fluorobiphenyl	83		30 - 130	04/20/15 15:05	04/21/15 23:34	1
p-Terphenyl-d14	99		30 - 130	04/20/15 15:05	04/21/15 23:34	1
2-Fluorophenol	39		15 - 110	04/20/15 15:05	04/21/15 23:34	1

Lab Sample ID: LCS 480-237381/2-A
Matrix: Water
Analysis Batch: 237610

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodiphenylamine	8.00	7.90		ug/L		99	40 - 140
Bis(2-ethylhexyl) phthalate	4.00	4.24	J	ug/L		106	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	84		15 - 110
Nitrobenzene-d5	77		30 - 130
Phenol-d5	34		15 - 110
2-Fluorobiphenyl	81		30 - 130
p-Terphenyl-d14	95		30 - 130
2-Fluorophenol	46		15 - 110

Lab Sample ID: LCSD 480-237381/3-A
Matrix: Water
Analysis Batch: 237610

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 237381

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
N-Nitrosodiphenylamine	8.00	7.97		ug/L		100	40 - 140	1	20
Bis(2-ethylhexyl) phthalate	4.00	4.25	J	ug/L		106	40 - 140	0	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol	88		15 - 110
Nitrobenzene-d5	86		30 - 130
Phenol-d5	35		15 - 110
2-Fluorobiphenyl	86		30 - 130
p-Terphenyl-d14	97		30 - 130
2-Fluorophenol	49		15 - 110

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 480-236551/3
Matrix: Water
Analysis Batch: 236551

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			04/16/15 10:35	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 480-236551/3
Matrix: Water
Analysis Batch: 236551

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		1.0	0.25	ug/L			04/16/15 10:35	1
Methyl tert-butyl ether	ND		1.0	0.25	ug/L			04/16/15 10:35	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			04/16/15 10:35	1
Naphthalene	ND		1.0	0.25	ug/L			04/16/15 10:35	1
o-Xylene	ND		1.0	0.25	ug/L			04/16/15 10:35	1
Toluene	ND		1.0	0.25	ug/L			04/16/15 10:35	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			04/16/15 10:35	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			04/16/15 10:35	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			04/16/15 10:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*91*		*73 - 144*		*04/16/15 10:35*	*1*
2,5-Dibromotoluene (pid)	*87*		*81 - 132*		*04/16/15 10:35*	*1*

Lab Sample ID: LCS 480-236551/4
Matrix: Water
Analysis Batch: 236551

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5.00	5.30		ug/L		106	70 - 130
Ethylbenzene	5.00	5.31		ug/L		106	70 - 130
Methyl tert-butyl ether	5.00	4.30		ug/L		86	70 - 130
m-Xylene & p-Xylene	10.0	10.8		ug/L		108	70 - 130
Naphthalene	5.00	4.90		ug/L		98	70 - 130
o-Xylene	5.00	5.32		ug/L		106	70 - 130
Toluene	5.00	5.37		ug/L		107	70 - 130
C5-C8 Aliphatics	15.0	16.3		ug/L		109	70 - 130
C9-C10 Aromatics	5.00	5.20		ug/L		104	70 - 130
C9-C12 Aliphatics	15.0	16.0		ug/L		107	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*98*		*73 - 144*
2,5-Dibromotoluene (pid)	*93*		*81 - 132*

Lab Sample ID: LCSD 480-236551/5
Matrix: Water
Analysis Batch: 236551

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	5.00	5.21		ug/L		104	70 - 130	2	25
Ethylbenzene	5.00	5.20		ug/L		104	70 - 130	2	25
Methyl tert-butyl ether	5.00	4.27		ug/L		85	70 - 130	1	25
m-Xylene & p-Xylene	10.0	10.5		ug/L		105	70 - 130	3	25
Naphthalene	5.00	4.87		ug/L		97	70 - 130	1	25
o-Xylene	5.00	5.14		ug/L		103	70 - 130	3	25
Toluene	5.00	5.23		ug/L		105	70 - 130	3	25
C5-C8 Aliphatics	15.0	16.3		ug/L		109	70 - 130	0	25
C9-C10 Aromatics	5.00	5.02		ug/L		100	70 - 130	4	25

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 480-236551/5
Matrix: Water
Analysis Batch: 236551

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C9-C12 Aliphatics			15.0	15.7		ug/L		105	70 - 130	2	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*93*		*73 - 144*
2,5-Dibromotoluene (pid)	*87*		*81 - 132*

Lab Sample ID: MB 480-236849/3
Matrix: Water
Analysis Batch: 236849

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.25	ug/L			04/17/15 10:35	1
Ethylbenzene	ND		1.0	0.25	ug/L			04/17/15 10:35	1
Methyl tert-butyl ether	ND		1.0	0.25	ug/L			04/17/15 10:35	1
m-Xylene & p-Xylene	ND		2.0	0.50	ug/L			04/17/15 10:35	1
Naphthalene	ND		1.0	0.25	ug/L			04/17/15 10:35	1
o-Xylene	ND		1.0	0.25	ug/L			04/17/15 10:35	1
Toluene	ND		1.0	0.25	ug/L			04/17/15 10:35	1
C5-C8 Aliphatics	ND		5.0	1.5	ug/L			04/17/15 10:35	1
C9-C10 Aromatics	ND		5.0	0.50	ug/L			04/17/15 10:35	1
C9-C12 Aliphatics	ND		5.0	1.5	ug/L			04/17/15 10:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*102*		*73 - 144*		*04/17/15 10:35*	*1*
2,5-Dibromotoluene (pid)	*95*		*81 - 132*		*04/17/15 10:35*	*1*

Lab Sample ID: LCS 480-236849/4
Matrix: Water
Analysis Batch: 236849

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene			5.00	5.29		ug/L		106	70 - 130
Ethylbenzene			5.00	5.25		ug/L		105	70 - 130
Methyl tert-butyl ether			5.00	3.83		ug/L		77	70 - 130
m-Xylene & p-Xylene			10.0	10.8		ug/L		108	70 - 130
Naphthalene			5.00	5.03		ug/L		101	70 - 130
o-Xylene			5.00	5.24		ug/L		105	70 - 130
Toluene			5.00	5.30		ug/L		106	70 - 130
C5-C8 Aliphatics			15.0	16.9		ug/L		112	70 - 130
C9-C10 Aromatics			5.00	5.17		ug/L		103	70 - 130
C9-C12 Aliphatics			15.0	15.9		ug/L		106	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*105*		*73 - 144*
2,5-Dibromotoluene (pid)	*100*		*81 - 132*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 480-236849/5
Matrix: Water
Analysis Batch: 236849

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			5.00	5.31		ug/L		106	70 - 130	0	25
Ethylbenzene			5.00	5.29		ug/L		106	70 - 130	1	25
Methyl tert-butyl ether			5.00	4.06		ug/L		81	70 - 130	6	25
m-Xylene & p-Xylene			10.0	10.7		ug/L		107	70 - 130	1	25
Naphthalene			5.00	4.89		ug/L		98	70 - 130	3	25
o-Xylene			5.00	5.24		ug/L		105	70 - 130	0	25
Toluene			5.00	5.33		ug/L		107	70 - 130	1	25
C5-C8 Aliphatics			15.0	17.1		ug/L		114	70 - 130	1	25
C9-C10 Aromatics			5.00	5.12		ug/L		102	70 - 130	1	25
C9-C12 Aliphatics			15.0	16.4		ug/L		109	70 - 130	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*103*		*73 - 144*
2,5-Dibromotoluene (pid)	*95*		*81 - 132*

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-236513/1-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	19	ug/L		04/16/15 12:05	04/17/15 19:43	1

Lab Sample ID: LCS 480-236513/2-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron			10000	9900		ug/L		99	80 - 120

Lab Sample ID: LCSD 480-236513/3-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron			10000	9930		ug/L		99	80 - 120	0	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-237416/2-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237416

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/20/15 19:30	04/22/15 16:19	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 480-237416/1-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237416

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.927		mg/L		93	90 - 110

Lab Sample ID: 480-78414-1 MS
Matrix: Ground Water
Analysis Batch: 237946

Client Sample ID: OC GW-16R
Prep Type: Total/NA
Prep Batch: 237416

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	4.6		0.500	5.05	4	mg/L		84	90 - 110

Method: 9040C - pH

Lab Sample ID: 480-78414-1 DU
Matrix: Ground Water
Analysis Batch: 236334

Client Sample ID: OC GW-16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.57	HF	6.610		SU		0.6	5

GC/MS VOA

Analysis Batch: 237178

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	8260C	
480-78414-2	OC TB	Total/NA	Water	8260C	
LCS 480-237178/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-237178/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-237178/7	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 237381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	3510C	
LCS 480-237381/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 480-237381/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 480-237381/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 237610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	8270D	237381
LCS 480-237381/2-A	Lab Control Sample	Total/NA	Water	8270D	237381
LCSD 480-237381/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	237381
MB 480-237381/1-A	Method Blank	Total/NA	Water	8270D	237381

GC VOA

Analysis Batch: 236551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	MAVPH	
480-78414-2	OC TB	Total/NA	Water	MAVPH	
LCS 480-236551/4	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 480-236551/5	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 480-236551/3	Method Blank	Total/NA	Water	MAVPH	

Analysis Batch: 236849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1 - DL	OC GW-16R	Total/NA	Ground Water	MAVPH	
LCS 480-236849/4	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 480-236849/5	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 480-236849/3	Method Blank	Total/NA	Water	MAVPH	

Analysis Batch: 237408

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	MA VPH	
480-78414-2	OC TB	Total/NA	Water	MA VPH	

Metals

Prep Batch: 236513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Dissolved	Ground Water	3005A	
LCS 480-236513/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 236513 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 480-236513/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-236513/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 237037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Dissolved	Ground Water	6010	236513
LCS 480-236513/2-A	Lab Control Sample	Total Recoverable	Water	6010	236513
LCSD 480-236513/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	236513
MB 480-236513/1-A	Method Blank	Total Recoverable	Water	6010	236513

General Chemistry

Analysis Batch: 236334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	9040C	
480-78414-1 DU	OC GW-16R	Total/NA	Ground Water	9040C	
LCS 480-236334/1	Lab Control Sample	Total/NA	Water	9040C	

Prep Batch: 237416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	Distill/Ammonia	
480-78414-1 MS	OC GW-16R	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-237416/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-237416/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 237936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-237416/1-A	Lab Control Sample	Total/NA	Water	350.1	237416
MB 480-237416/2-A	Method Blank	Total/NA	Water	350.1	237416

Analysis Batch: 237946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78414-1	OC GW-16R	Total/NA	Ground Water	350.1	237416
480-78414-1 MS	OC GW-16R	Total/NA	Ground Water	350.1	237416

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Client Sample ID: OC GW-16R

Lab Sample ID: 480-78414-1

Date Collected: 04/14/15 08:25

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	237178	04/20/15 04:17	SWO	TAL BUF
Total/NA	Prep	3510C			237381	04/20/15 15:05	CPH	TAL BUF
Total/NA	Analysis	8270D		10	237610	04/22/15 01:04	LMW	TAL BUF
Total/NA	Analysis	MA VPH		500	237408	04/20/15 17:03	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	236551	04/16/15 16:28	AJM	TAL BUF
Total/NA	Analysis	MAVPH	DL	500	236849	04/17/15 17:36	AJM	TAL BUF
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:46	LMH	TAL BUF
Total/NA	Prep	Distill/Ammonia			237416	04/20/15 19:30	KMF	TAL BUF
Total/NA	Analysis	350.1		5	237946	04/22/15 18:37	KMF	TAL BUF
Total/NA	Analysis	9040C		1	236334	04/15/15 12:50	LED	TAL BUF

Client Sample ID: OC TB

Lab Sample ID: 480-78414-2

Date Collected: 04/14/15 00:00

Matrix: Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	237178	04/20/15 04:41	SWO	TAL BUF
Total/NA	Analysis	MA VPH		1	237408	04/20/15 17:03	GSR	TAL BUF
Total/NA	Analysis	MAVPH		1	236551	04/16/15 15:11	AJM	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Iron
8260C		Ground Water	2,4,4-Trimethyl-1-pentene
8260C		Ground Water	2,4,4-Trimethyl-2-pentene
8260C		Water	2,4,4-Trimethyl-1-pentene
8260C		Water	2,4,4-Trimethyl-2-pentene
8270D	3510C	Ground Water	Bis(2-ethylhexyl) phthalate
8270D	3510C	Ground Water	N-Nitrosodiphenylamine
9040C		Ground Water	pH
MAVPH		Ground Water	Benzene
MAVPH		Ground Water	C5-C8 Aliphatics
MAVPH		Ground Water	C9-C10 Aromatics
MAVPH		Ground Water	C9-C12 Aliphatics
MAVPH		Ground Water	Ethylbenzene
MAVPH		Ground Water	Methyl tert-butyl ether
MAVPH		Ground Water	m-Xylene & p-Xylene
MAVPH		Ground Water	Naphthalene
MAVPH		Ground Water	o-Xylene
MAVPH		Ground Water	Toluene
MAVPH		Water	Benzene
MAVPH		Water	C5-C8 Aliphatics
MAVPH		Water	C9-C10 Aromatics
MAVPH		Water	C9-C12 Aliphatics
MAVPH		Water	Ethylbenzene
MAVPH		Water	Methyl tert-butyl ether
MAVPH		Water	m-Xylene & p-Xylene
MAVPH		Water	Naphthalene
MAVPH		Water	o-Xylene
MAVPH		Water	Toluene

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL BUF
8270D	Semivolatile Organic Compounds (GC/MS) Low Level	MA DEP	TAL BUF
MA VPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL BUF
6010	Metals (ICP)	SW846	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
9040C	pH	SW846	TAL BUF

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78414-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-78414-1	OC GW-16R	Ground Water	04/14/15 08:25	04/15/15 01:35
480-78414-2	OC TB	Water	04/14/15 00:00	04/15/15 01:35

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-78414-1

Login Number: 78414

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	No: No sample date and/or time on COC, logged in per container labels.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	No: Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
501 Southhampton Rd. Suite C
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-78414 Chain of Custody

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testamericainc.c
Company: Olin Corporation		
Address: PO BOX 248	Due Date Requested:	
City: Charleston	TAT Requested (days):	
State, Zip: TN, 37310-0248		
Phone: 423-336-4012(Tel)	PO #: REWI0025	
Email: jmcashwell@olin.com	WO #:	
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (Mar	Project #: 48006612	
Site: Massachusetts	SSOW#:	

566.2

An

Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0 28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Dissolved Al/Cr	2510B - Specific Conductance	MAV PH	8260 MCP	8270	SM 4500 Ht PH	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N						
Gw 16R				Water				✓	✓		✓	✓	✓	✓	11	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4-14-15		[signature]	4-14-15 1250	TA
[signature]	4-14-15 1700		[signature]	15APR15 0135	TAB

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: #1 0-7

4/28/2015

June 30, 2015

To: James Cashwell
From: Chris Ricardi
Subject: 51 Eames Street Property Slurry Wall
Quarterly Monitoring Program 1Q15 – April 2015

DATA VALIDATION REPORT
APRIL 2015 SLURRY WALL GROUNDWATER AND SURFACE WATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Sets: 480-78415-1 and 480-78416-1

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site on April 6 through April 8, and on April 14, 2015. Samples were analyzed by TestAmerica Laboratories Inc. in Buffalo, New York. Data were reported in sample delivery groups (SDGs) 480-78415-1 and 480-78416-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for one or more of the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- Dissolved Metals (aluminum and chromium) by USEPA Method 6010C in groundwater
- Dissolved and Total Metals (aluminum, chromium, and sodium) by USEPA Method 6010C in surface water
- General chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1B), chloride and sulfate by USEPA Method 300.0, nitrate and nitrite by Method 353.2, and specific conductance by SM A2510B

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of data validation actions and associated qualifier reason codes is presented in Table 3.

2.0 METALS

Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample / Laboratory Control Sample Duplicate Analysis (LCS/LCSD)
* Matrix Spike / Matrix Spike Duplicate Analysis (groundwater only)

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
+1 978-692-9090
amecfw.com

Detection Limits
* Dissolved vs. Total Metals Comparison (surface water only)

* indicates that criteria were met for this parameter

Detection Limits

The reporting limit for aluminum (200 µg/L) is greater than the reporting limit of 100 µg/L specified in the Final Interim Response Steps Work Plan (IRSWP). Positively detected results are reported to the method detection limit (MDL) of 60 µg/L.

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
Blanks
* Laboratory Duplicate Analysis (specific conductance, ammonia, and nitrite)
* LCS/LCSD
* Matrix Spike / Matrix Spike Duplicate Analysis
Detection Limits

* indicates that criteria were met for this parameter

Blanks

SDG 480-78415-1

Nitrite (0.0202 J mg/L and 0.0212 J mg/L) was reported in two method blanks associated with samples in SDG 480-78415-1. Action levels were established at five times the reported method blank concentrations. Positive detections of nitrite were reported in associated samples below the action level and below the reporting limit of 0.05 mg/L and were qualified as not detected at the reporting limit. Results were assigned a reason code of BL1 in Table 3.

Detection Limits

SDG 480-78415-1

The reporting limit for nitrite (0.05 mg/L) was higher than the reporting limit specified in the IRSWP of 0.01 mg/L.

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.

Chris Ricardi
Senior Chemist

6/30/15
Date

Michael Murphy
Project Principal

6/30/2015
Date

REFERENCES:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, DC 20005.

MACTEC, 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8, 2007.

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U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 - December 1996.

Table 1 - Sample and Analytical Summary
Data Validation Report
April 2015 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Location	Sample ID	Sample Date	Media	Method Class / Analysis Method / Fraction / Qc Code	Metals SW6010 D Param_Count	Metals SW6010 T Param_Count	Inorganics & Wet Chem E300 T Param_Count	Inorganics & Wet Chem E350.1 T Param_Count	Inorganics & Wet Chem E353.2_NO2 T Param_Count	Inorganics & Wet Chem E353.2_NO3 T Param_Count	Specific Conductance A2510B T Param_Count
480-78415-1	ISCO1	OC-ISCO1	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	ISCO2	OC-ISCO2	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	ISCO3	OC-ISCO3	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	PZ-16RR	OC-PZ-16RRSW	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	PZ-17RRR	OC-PZ-17RRRSW	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	PZ-18R	OC-PZ-18RSW	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78415-1	SD-17	OC-SD-17	4/14/2015	SW	FS	3	3	2	1	1	1	1
480-78416-1	GW-202D	OC-GW-202D	4/6/2015	GW	FS	2		2	1			1
480-78416-1	GW-202D	OC-GW-202D Dup	4/6/2015	GW	FD	2		2	1			1
480-78416-1	GW-202S	OC-GW-202S	4/6/2015	GW	FS	2		2	1			1
480-78416-1	GW-25	OC-GW-25	4/7/2015	GW	FS	2		2	1			1
480-78416-1	GW-78S	OC-GW-78S	4/8/2015	GW	FS	2		2	1			1
480-78416-1	GW-79S	OC-GW-79S	4/8/2015	GW	FS	2		2	1			1
480-78416-1	PZ-16RR	OC-PZ-16RR	4/8/2015	GW	FS	2		2	1			1
480-78416-1	PZ-17RRR	OC-PZ-17RRR	4/8/2015	GW	FS	2		2	1			1
480-78416-1	PZ-18R	OC-PZ-18R	4/7/2015	GW	FS	2		2	1			1
480-78416-1	PZ-24	OC-PZ-24	4/6/2015	GW	FS	2		2	1			1
480-78416-1	PZ-25	OC-PZ-25	4/6/2015	GW	FS	2		2	1			1

Notes:
Number listed under method indicates number of target analytes reported.

Table 2
Final Results Summary
Data Validation Report
April 2015 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab SDG	480-78416-1		480-78416-1		480-78416-1		480-78416-1		480-78416-1		480-78416-1	
		Location	GW-202D		GW-202D		GW-202S		GW-25		GW-78S		GW-79S	
		Field Sample Date	4/6/2015		4/6/2015		4/6/2015		4/7/2015		4/8/2015		4/8/2015	
		Field Sample ID	OC-GW-202D		OC-GW-202D Dup		OC-GW-202S		OC-GW-25		OC-GW-78S		OC-GW-79S	
		Qc Code	FS		FD		FS		FS		FS		FS	
			GW		GW		GW		GW		GW		GW	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW6010	D	Aluminum	ug/l	2,500		2,500		200	U	200	U	200	U	200	U
SW6010	D	Chromium	ug/l	260		270		2.9	J	6.2		2.3	J	6.1	
E300	T	Chloride	mg/l	290	J	270		130		9.9	J	16		140	
E300	T	Sulfate	mg/l	1400	J	1400		120	J	220		490		910	
E350.1	T	Ammonia	mg/l	160		180		29		19		35		87	
A2510B	T	Lab Specific Conductance	umhos/cm	3,600		3,600		870		970		1,400		2,400	

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary
Data Validation Report
April 2015 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab SDG	480-78416-1		480-78416-1		480-78416-1		480-78416-1		480-78416-1	
		Location	PZ-16RR		PZ-17RRR		PZ-18R		PZ-24		PZ-25	
		Field Sample Date	4/8/2015		4/8/2015		4/7/2015		4/6/2015		4/6/2015	
		Field Sample ID	OC-PZ-16RR		OC-PZ-17RRR		OC-PZ-18R		OC-PZ-24		OC-PZ-25	
		Qc Code	FS		FS		FS		FS		FS	
			GW		GW		GW		GW		GW	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW6010	D	Aluminum	ug/l	200	U	200	U	200	U	200	U	200	U
SW6010	D	Chromium	ug/l	6.1		5.6		36		36		7.5	
E300	T	Chloride	mg/l	140		16		650		28		250	
E300	T	Sulfate	mg/l	920		510		1900		770		45	
E350.1	T	Ammonia	mg/l	90		28		360		42		24	
A2510B	T	Lab Specific Conductance	umhos/cm	2,600		1,500		5,600		2,000		1,100	

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary
Data Validation Report
April 2015 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab SDG	480-78415-1		480-78415-1		480-78415-1		480-78415-1		480-78415-1		480-78415-1		480-78415-1	
		Location	ISCO1		ISCO2		ISCO3		PZ-16RR		PZ-17RRR		PZ-18R		SD-17	
		Field Sample Date	4/14/2015		4/14/2015		4/14/2015		4/14/2015		4/14/2015		4/14/2015		4/14/2015	
		Field Sample ID	OC-ISCO1		OC-ISCO2		OC-ISCO3		OC-PZ-16RRSW		OC-PZ-17RRRSW		OC-PZ-18RSW		OC-SD-17	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
			SW		SW		SW		SW		SW		SW		SW	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW6010	D	Aluminum	ug/l	75	J	270		200	U	160	J	160	J	98	J	150	J
SW6010	D	Chromium	ug/l	7.2		37		5	U	57		70		7.6		65	
SW6010	D	Sodium	ug/l	120000		84000		130000		110000		110000		110000		100000	
SW6010	T	Aluminum	ug/l	180	J	990		850		1200		1200		180	J	1100	
SW6010	T	Chromium	ug/l	9.1		120		3.8	J	220		250		9		220	
SW6010	T	Sodium	ug/l	120000		91000		150000		120000		110000		120000		110000	
E300	T	Chloride	mg/l	230		150		350		210		180		250		200	
E300	T	Sulfate	mg/l	68		130	J	710		150	J	110	J	1600		120	J
E350.1	T	Ammonia	mg/l	15		19		1.5		26		19		17		20	
E353.2	T	Nitrate as N	mg/l	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.67	
E353.2	T	Nitrite as N	mg/l	0.4		0.71		0.82		0.55		0.63		0.41		0.05	U
A2510B	T	Lab Specific Conductance	umhos/cm	990		880		1,200		1,100		980		990		960	

Notes:
T = Total
D = Dissolved
FS = field sample
FD = field duplicate
U = not detected, value is the quantitation limit
J = value is estimated
ug/l = microgram per liter
mg/l = milligram per liter
umhos/cm = micro reciprocal ohms per centimeter

Table 3
Validation Qualification Action Summary
Data Validation Report
April 2015 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Analysis Method	Lab Sample ID	Field Sample ID	Parameter Name	Lab Result	Lab Qualifier	Validated Result	Validated Qualifier	Val Reason Code	Result Units	Lab ID
480-78415-1	E353.2_NO2	480-78415-1	OC-ISCO1	Nitrite as N	0.024	J B	0.05	U	BL1	mg/l	TALBFLO
480-78415-1	E353.2_NO2	480-78415-2	OC-ISCO2	Nitrite as N	0.037	J B	0.05	U	BL1	mg/l	TALBFLO
480-78415-1	E353.2_NO2	480-78415-4	OC-PZ-16RRSW	Nitrite as N	0.027	J B	0.05	U	BL1	mg/l	TALBFLO
480-78415-1	E353.2_NO2	480-78415-5	OC-PZ-17RRRSW	Nitrite as N	0.028	J B	0.05	U	BL1	mg/l	TALBFLO
480-78415-1	E353.2_NO2	480-78415-6	OC-PZ-18RSW	Nitrite as N	0.024	J B	0.05	U	BL1	mg/l	TALBFLO
480-78415-1	E353.2_NO2	480-78415-7	OC-SD-17	Nitrite as N	0.026	J B	0.05	U	BL1	mg/l	TALBFLO

Validation Reason Codes:

BL1 = Method blank qualifier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-78415-1
Client Project/Site: Olin Chemical Wilmington MA
Sampling Event: Surfacewater Quarterly (March/August)

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
4/28/2015 10:45:23 AM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-78415-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 4/15/2015 at 1:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7º C.

HPLC/IC
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-ISCO1 (480-78415-1), OC-ISCO3 (480-78415-3), OC-PZ-18RSW (480-78415-6), (480-78415-E-1 MS), OC-ISCO2 (480-78415-2), OC-ISCO3 (480-78415-3), OC-PZ-16RRSW (480-78415-4), OC-PZ-17RRRSW (480-78415-5), OC-PZ-18RSW (480-78415-6), OC-SD-17 (480-78415-7) and (480-78415-E-7 MS). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

Method 6010: The low level continuing calibration verification (CCVL 480-236879/29) for analytical batch 480-236879 contained dissolved chromium above the upper quality control limit. All reported samples associated with this CCVL were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples (LCS 480-236394/2-A), (LCSD 480-236394/3-A) and (MB 480-236394/1-A) was not performed.

Method 6010: The Low Level Continuing Calibration Verification (CCVL 480-237042/40) contained total aluminum outside the control limits. All reported samples OC-ISCO1 (480-78415-1) and OC-PZ-18RSW (480-78415-6) associated with this CCVL were either below the laboratory's standard reporting limit for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-78415-1**

Project Location: **Olin Chemical Wilmington MA** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-78415-1 [1-7]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ■ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 4/28/15 10:41

This form has been electronically signed and approved.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-ISCO1 — Lab Sample ID: 480-78415-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	9.1		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	180	J	200	60	ug/L	1		6010	Total/NA
Sodium	120000		1000	320	ug/L	1		6010	Total/NA
Chromium	7.2		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	75	J	200	60	ug/L	1		6010	Dissolved
Sodium	120000		1000	320	ug/L	1		6010	Dissolved
Chloride	230		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	68		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	15		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.40		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.024	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	990		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO2 — Lab Sample ID: 480-78415-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	120		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	990		200	60	ug/L	1		6010	Total/NA
Sodium	91000		1000	320	ug/L	1		6010	Total/NA
Chromium	37		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	270		200	60	ug/L	1		6010	Dissolved
Sodium	84000		1000	320	ug/L	1		6010	Dissolved
Chloride	150		50	28	mg/L	100		300.0	Total/NA
Sulfate	130	J	200	35	mg/L	100		300.0	Total/NA
Ammonia	19		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.71		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.037	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	880		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO3 — Lab Sample ID: 480-78415-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.8	J	5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	850		200	60	ug/L	1		6010	Total/NA
Sodium	150000		1000	320	ug/L	1		6010	Total/NA
Sodium	130000		1000	320	ug/L	1		6010	Dissolved
Chloride	350		100	56	mg/L	200		300.0	Total/NA
Sulfate	710		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	1.5		0.20	0.10	mg/L	1		350.1	Total/NA
Nitrate as N	0.82		0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1200		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-16RRSW — Lab Sample ID: 480-78415-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	220		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	1200		200	60	ug/L	1		6010	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-PZ-16RRSW (Continued) — Lab Sample ID: 480-78415-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	120000		1000	320	ug/L	1		6010	Total/NA
Chromium	57		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	160	J	200	60	ug/L	1		6010	Dissolved
Sodium	110000		1000	320	ug/L	1		6010	Dissolved
Chloride	210		100	56	mg/L	200		300.0	Total/NA
Sulfate	150	J	400	70	mg/L	200		300.0	Total/NA
Ammonia	26		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.55		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.027	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17RRRSW — Lab Sample ID: 480-78415-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	250		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	1200		200	60	ug/L	1		6010	Total/NA
Sodium	110000		1000	320	ug/L	1		6010	Total/NA
Chromium	70		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	160	J	200	60	ug/L	1		6010	Dissolved
Sodium	110000		1000	320	ug/L	1		6010	Dissolved
Chloride	180		100	56	mg/L	200		300.0	Total/NA
Sulfate	110	J	400	70	mg/L	200		300.0	Total/NA
Ammonia	19		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.63		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.028	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	980		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18RSW — Lab Sample ID: 480-78415-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	9.0		5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	180	J	200	60	ug/L	1		6010	Total/NA
Sodium	120000		1000	320	ug/L	1		6010	Total/NA
Chromium	7.6		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	98	J	200	60	ug/L	1		6010	Dissolved
Sodium	110000		1000	320	ug/L	1		6010	Dissolved
Chloride	250		100	56	mg/L	200		300.0	Total/NA
Sulfate	1600		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	17		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.41		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.024	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	990		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SD-17 — Lab Sample ID: 480-78415-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	220		5.0	1.0	ug/L	1		6010	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-SD-17 (Continued)

Lab Sample ID: 480-78415-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	1100		200	60	ug/L	1		6010	Total/NA
Sodium	110000		1000	320	ug/L	1		6010	Total/NA
Chromium	65		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	150	J	200	60	ug/L	1		6010	Dissolved
Sodium	100000		1000	320	ug/L	1		6010	Dissolved
Chloride	200		100	56	mg/L	200		300.0	Total/NA
Sulfate	120	J	400	70	mg/L	200		300.0	Total/NA
Ammonia	20		4.0	2.0	mg/L	20		350.1	Total/NA
Nitrate as N	0.67		0.050	0.020	mg/L	1		353.2	Total/NA
Nitrite as N	0.026	J B	0.050	0.020	mg/L	1		353.2	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	960		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-ISCO1

Lab Sample ID: 480-78415-1

Date Collected: 04/14/15 11:40

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	9.1		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:31	1
Aluminum	180	J	200	60	ug/L		04/15/15 08:10	04/17/15 19:31	1
Sodium	120000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:31	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	7.2		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:18	1
Aluminum	75	J	200	60	ug/L		04/15/15 08:02	04/16/15 18:36	1
Sodium	120000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	230		10	5.6	mg/L			04/18/15 03:39	20
Sulfate	68		40	7.0	mg/L			04/18/15 03:39	20
Ammonia	15		4.0	2.0	mg/L		04/21/15 16:48	04/22/15 18:04	20
Nitrate as N	0.40		0.050	0.020	mg/L			04/15/15 19:23	1
Nitrite as N	0.024	J B	0.050	0.020	mg/L			04/15/15 19:23	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	990		1.0	1.0	umhos/cm			04/20/15 18:04	1

Client Sample ID: OC-ISCO2

Lab Sample ID: 480-78415-2

Date Collected: 04/14/15 09:55

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	120		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:34	1
Aluminum	990		200	60	ug/L		04/15/15 08:10	04/18/15 09:09	1
Sodium	91000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:34	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	37		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:20	1
Aluminum	270		200	60	ug/L		04/15/15 08:02	04/16/15 18:38	1
Sodium	84000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		50	28	mg/L			04/21/15 03:49	100
Sulfate	130	J	200	35	mg/L			04/21/15 03:49	100
Ammonia	19		4.0	2.0	mg/L		04/21/15 16:48	04/22/15 18:05	20
Nitrate as N	0.71		0.050	0.020	mg/L			04/15/15 19:24	1
Nitrite as N	0.037	J B	0.050	0.020	mg/L			04/15/15 19:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	880		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-ISCO3

Lab Sample ID: 480-78415-3

Date Collected: 04/14/15 09:40

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	3.8	J	5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:37	1
Aluminum	850		200	60	ug/L		04/15/15 08:10	04/18/15 09:11	1
Sodium	150000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:37	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:23	1
Aluminum	ND		200	60	ug/L		04/15/15 08:02	04/16/15 18:41	1
Sodium	130000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	350		100	56	mg/L			04/21/15 04:04	200
Sulfate	710		40	7.0	mg/L			04/18/15 05:24	20
Ammonia	1.5		0.20	0.10	mg/L		04/21/15 16:48	04/22/15 18:06	1
Nitrate as N	0.82		0.050	0.020	mg/L			04/15/15 19:25	1
Nitrite as N	ND		0.050	0.020	mg/L			04/15/15 19:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1200		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-16RRSW

Lab Sample ID: 480-78415-4

Date Collected: 04/14/15 10:25

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	220		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:40	1
Aluminum	1200		200	60	ug/L		04/15/15 08:10	04/18/15 09:14	1
Sodium	120000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:40	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	57		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:34	1
Aluminum	160	J	200	60	ug/L		04/15/15 08:02	04/16/15 18:52	1
Sodium	110000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		100	56	mg/L			04/21/15 04:19	200
Sulfate	150	J	400	70	mg/L			04/21/15 04:19	200
Ammonia	26		4.0	2.0	mg/L		04/21/15 16:48	04/22/15 18:07	20
Nitrate as N	0.55		0.050	0.020	mg/L			04/15/15 19:26	1
Nitrite as N	0.027	J B	0.050	0.020	mg/L			04/15/15 19:26	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1100		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-PZ-17RRRSW

Lab Sample ID: 480-78415-5

Date Collected: 04/14/15 10:45

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	250		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:51	1
Aluminum	1200		200	60	ug/L		04/15/15 08:10	04/18/15 09:17	1
Sodium	110000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:51	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	70		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:37	1
Aluminum	160	J	200	60	ug/L		04/15/15 08:02	04/16/15 18:55	1
Sodium	110000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		100	56	mg/L			04/21/15 04:33	200
Sulfate	110	J	400	70	mg/L			04/21/15 04:33	200
Ammonia	19		4.0	2.0	mg/L		04/21/15 17:02	04/22/15 18:11	20
Nitrate as N	0.63		0.050	0.020	mg/L			04/15/15 19:28	1
Nitrite as N	0.028	J B	0.050	0.020	mg/L			04/15/15 19:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	980		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-18RSW

Lab Sample ID: 480-78415-6

Date Collected: 04/14/15 11:25

Matrix: Surface Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	9.0		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:54	1
Aluminum	180	J	200	60	ug/L		04/15/15 08:10	04/17/15 19:54	1
Sodium	120000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:54	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	7.6		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:39	1
Aluminum	98	J	200	60	ug/L		04/15/15 08:02	04/16/15 18:57	1
Sodium	110000		1000	320	ug/L		04/15/15 08:02	04/16/15 18:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		100	56	mg/L			04/21/15 04:48	200
Sulfate	1600		40	7.0	mg/L			04/18/15 06:28	20
Ammonia	17		4.0	2.0	mg/L		04/21/15 17:02	04/22/15 18:12	20
Nitrate as N	0.41		0.050	0.020	mg/L			04/15/15 19:31	1
Nitrite as N	0.024	J B	0.050	0.020	mg/L			04/15/15 19:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	990		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-SD-17
Date Collected: 04/14/15 11:05
Date Received: 04/15/15 01:35

Lab Sample ID: 480-78415-7
Matrix: Surface Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	220		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 19:57	1
Aluminum	1100		200	60	ug/L		04/15/15 08:10	04/18/15 09:28	1
Sodium	110000		1000	320	ug/L		04/15/15 08:10	04/17/15 19:57	1

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	65		5.0	1.0	ug/L		04/15/15 08:02	04/17/15 16:42	1
Aluminum	150	J	200	60	ug/L		04/15/15 08:02	04/16/15 19:00	1
Sodium	100000		1000	320	ug/L		04/15/15 08:02	04/16/15 19:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	200		100	56	mg/L			04/21/15 05:03	200
Sulfate	120	J	400	70	mg/L			04/21/15 05:03	200
Ammonia	20		4.0	2.0	mg/L		04/21/15 17:02	04/22/15 18:13	20
Nitrate as N	0.67		0.050	0.020	mg/L			04/15/15 19:32	1
Nitrite as N	0.026	J B	0.050	0.020	mg/L			04/15/15 19:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	960		1.0	1.0	umhos/cm			04/20/15 13:01	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-236384/1-A
Matrix: Water
Analysis Batch: 237042

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 236384

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		04/15/15 08:10	04/17/15 18:44	1
Aluminum	ND		200	60	ug/L		04/15/15 08:10	04/17/15 18:44	1
Sodium	ND		1000	320	ug/L		04/15/15 08:10	04/17/15 18:44	1

Lab Sample ID: LCS 480-236384/2-A
Matrix: Water
Analysis Batch: 237042

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 236384

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	206		ug/L		103	80 - 120
Aluminum	10000	10800		ug/L		108	80 - 120
Sodium	10000	10300		ug/L		103	80 - 120

Lab Sample ID: LCSD 480-236384/3-A
Matrix: Water
Analysis Batch: 237042

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 236384

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	207		ug/L		103	80 - 120	1	20
Aluminum	10000	10800		ug/L		108	80 - 120	1	20
Sodium	10000	10300		ug/L		103	80 - 120	1	20

Lab Sample ID: MB 480-236394/1-A
Matrix: Water
Analysis Batch: 236879

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 236394

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		04/15/15 08:02	04/16/15 17:46	1
Aluminum	ND		200	60	ug/L		04/15/15 08:02	04/16/15 17:46	1
Sodium	ND		1000	320	ug/L		04/15/15 08:02	04/16/15 17:46	1

Lab Sample ID: LCS 480-236394/2-A
Matrix: Water
Analysis Batch: 236879

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 236394

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	197		ug/L		98	80 - 120
Aluminum	10000	10200		ug/L		102	80 - 120
Sodium	10000	9070		ug/L		91	80 - 120

Lab Sample ID: LCSD 480-236394/3-A
Matrix: Water
Analysis Batch: 236879

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 236394

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	200		ug/L		100	80 - 120	2	20
Aluminum	10000	10400		ug/L		104	80 - 120	2	20
Sodium	10000	9300		ug/L		93	80 - 120	3	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-236851/28
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/18/15 01:13	1
Sulfate	ND		2.0	0.35	mg/L			04/18/15 01:13	1

Lab Sample ID: LCS 480-236851/27
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.1		mg/L		100	83 - 121
Sulfate	20.0	19.8		mg/L		99	80 - 129

Lab Sample ID: 480-78415-1 MS
Matrix: Surface Water
Analysis Batch: 236851

Client Sample ID: OC-ISCO1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	230		500	674		mg/L		89	83 - 121
Sulfate	68		500	506		mg/L		88	80 - 129

Lab Sample ID: MB 480-237298/28
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/21/15 00:24	1
Sulfate	ND		2.0	0.35	mg/L			04/21/15 00:24	1

Lab Sample ID: MB 480-237298/4
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/20/15 18:32	1
Sulfate	ND		2.0	0.35	mg/L			04/20/15 18:32	1

Lab Sample ID: LCS 480-237298/27
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.9		mg/L		104	83 - 121
Sulfate	20.0	20.9		mg/L		104	80 - 129

Lab Sample ID: LCS 480-237298/3
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.4		mg/L		102	83 - 121

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-237298/3
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	20.0	20.6		mg/L		103	80 - 129

Lab Sample ID: 480-78415-7 MS
Matrix: Surface Water
Analysis Batch: 237298

Client Sample ID: OC-SD-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200		5000	5470		mg/L		106	83 - 121
Sulfate	120	J	5000	5390		mg/L		105	80 - 129

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-237653/2-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/21/15 16:48	04/22/15 16:21	1

Lab Sample ID: LCS 480-237653/1-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.07		mg/L		107	90 - 110

Lab Sample ID: 480-78415-4 MS
Matrix: Surface Water
Analysis Batch: 237946

Client Sample ID: OC-PZ-16RRSW
Prep Type: Total/NA
Prep Batch: 237653

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	26		0.500	25.4	4	mg/L		-200	90 - 110

Lab Sample ID: MB 480-237654/2-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237654

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/21/15 17:02	04/22/15 16:22	1

Lab Sample ID: LCS 480-237654/1-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237654

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.936		mg/L		94	90 - 110

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-236426/27
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	0.0202	J	0.050	0.020	mg/L			04/15/15 19:17	1

Lab Sample ID: MB 480-236426/3
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	0.0212	J	0.050	0.020	mg/L			04/15/15 18:51	1

Lab Sample ID: MB 480-236426/51
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.020	mg/L			04/15/15 19:44	1

Lab Sample ID: LCS 480-236426/28
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	1.50	1.46		mg/L		97	90 - 110

Lab Sample ID: LCS 480-236426/4
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	1.50	1.44		mg/L		96	90 - 110

Lab Sample ID: LCS 480-236426/52
Matrix: Water
Analysis Batch: 236426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	1.50	1.47		mg/L		98	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-237414/1
Matrix: Water
Analysis Batch: 237414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	998	1010		umhos/cm		102	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: LCS 480-237414/89
Matrix: Water
Analysis Batch: 237414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	998	968		umhos/cm		97	90 - 110

Lab Sample ID: 480-78415-6 DU
Matrix: Surface Water
Analysis Batch: 237414

Client Sample ID: OC-PZ-18RSW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	990		990		umhos/cm		0.2	20

Metals

Prep Batch: 236384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	3005A	
480-78415-2	OC-ISCO2	Total/NA	Surface Water	3005A	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	3005A	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	3005A	
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	3005A	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	3005A	
480-78415-7	OC-SD-17	Total/NA	Surface Water	3005A	
LCS 480-236384/2-A	Lab Control Sample	Total/NA	Water	3005A	
LCSD 480-236384/3-A	Lab Control Sample Dup	Total/NA	Water	3005A	
MB 480-236384/1-A	Method Blank	Total/NA	Water	3005A	

Prep Batch: 236394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Dissolved	Surface Water	3005A	
480-78415-2	OC-ISCO2	Dissolved	Surface Water	3005A	
480-78415-3	OC-ISCO3	Dissolved	Surface Water	3005A	
480-78415-4	OC-PZ-16RRSW	Dissolved	Surface Water	3005A	
480-78415-5	OC-PZ-17RRRSW	Dissolved	Surface Water	3005A	
480-78415-6	OC-PZ-18RSW	Dissolved	Surface Water	3005A	
480-78415-7	OC-SD-17	Dissolved	Surface Water	3005A	
LCS 480-236394/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-236394/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-236394/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 236879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Dissolved	Surface Water	6010	236394
480-78415-2	OC-ISCO2	Dissolved	Surface Water	6010	236394
480-78415-3	OC-ISCO3	Dissolved	Surface Water	6010	236394
480-78415-4	OC-PZ-16RRSW	Dissolved	Surface Water	6010	236394
480-78415-5	OC-PZ-17RRRSW	Dissolved	Surface Water	6010	236394
480-78415-6	OC-PZ-18RSW	Dissolved	Surface Water	6010	236394
480-78415-7	OC-SD-17	Dissolved	Surface Water	6010	236394
LCS 480-236394/2-A	Lab Control Sample	Total Recoverable	Water	6010	236394
LCSD 480-236394/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	236394
MB 480-236394/1-A	Method Blank	Total Recoverable	Water	6010	236394

Analysis Batch: 237032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Dissolved	Surface Water	6010	236394
480-78415-2	OC-ISCO2	Dissolved	Surface Water	6010	236394
480-78415-3	OC-ISCO3	Dissolved	Surface Water	6010	236394
480-78415-4	OC-PZ-16RRSW	Dissolved	Surface Water	6010	236394
480-78415-5	OC-PZ-17RRRSW	Dissolved	Surface Water	6010	236394
480-78415-6	OC-PZ-18RSW	Dissolved	Surface Water	6010	236394
480-78415-7	OC-SD-17	Dissolved	Surface Water	6010	236394

Analysis Batch: 237042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	6010	236384
480-78415-2	OC-ISCO2	Total/NA	Surface Water	6010	236384

Metals (Continued)

Analysis Batch: 237042 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-3	OC-ISCO3	Total/NA	Surface Water	6010	236384
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	6010	236384
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	6010	236384
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	6010	236384
480-78415-7	OC-SD-17	Total/NA	Surface Water	6010	236384
LCS 480-236384/2-A	Lab Control Sample	Total/NA	Water	6010	236384
LCSD 480-236384/3-A	Lab Control Sample Dup	Total/NA	Water	6010	236384
MB 480-236384/1-A	Method Blank	Total/NA	Water	6010	236384

Analysis Batch: 237197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-2	OC-ISCO2	Total/NA	Surface Water	6010	236384
480-78415-3	OC-ISCO3	Total/NA	Surface Water	6010	236384
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	6010	236384
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	6010	236384
480-78415-7	OC-SD-17	Total/NA	Surface Water	6010	236384

General Chemistry

Analysis Batch: 236426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	353.2	
480-78415-2	OC-ISCO2	Total/NA	Surface Water	353.2	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	353.2	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	353.2	
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	353.2	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-78415-7	OC-SD-17	Total/NA	Surface Water	353.2	
LCS 480-236426/28	Lab Control Sample	Total/NA	Water	353.2	
LCS 480-236426/4	Lab Control Sample	Total/NA	Water	353.2	
LCS 480-236426/52	Lab Control Sample	Total/NA	Water	353.2	
MB 480-236426/27	Method Blank	Total/NA	Water	353.2	
MB 480-236426/3	Method Blank	Total/NA	Water	353.2	
MB 480-236426/51	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 236460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	353.2	
480-78415-2	OC-ISCO2	Total/NA	Surface Water	353.2	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	353.2	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	353.2	
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	353.2	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	353.2	
480-78415-7	OC-SD-17	Total/NA	Surface Water	353.2	

Analysis Batch: 236851

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	300.0	
480-78415-1 MS	OC-ISCO1	Total/NA	Surface Water	300.0	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	300.0	

General Chemistry (Continued)

Analysis Batch: 236851 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	300.0	
LCS 480-236851/27	Lab Control Sample	Total/NA	Water	300.0	
MB 480-236851/28	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 237298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-2	OC-ISCO2	Total/NA	Surface Water	300.0	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	300.0	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	300.0	
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	300.0	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	300.0	
480-78415-7	OC-SD-17	Total/NA	Surface Water	300.0	
480-78415-7 MS	OC-SD-17	Total/NA	Surface Water	300.0	
LCS 480-237298/27	Lab Control Sample	Total/NA	Water	300.0	
LCS 480-237298/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-237298/28	Method Blank	Total/NA	Water	300.0	
MB 480-237298/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 237414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	SM 2510B	
480-78415-2	OC-ISCO2	Total/NA	Surface Water	SM 2510B	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	SM 2510B	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	SM 2510B	
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	SM 2510B	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	SM 2510B	
480-78415-6 DU	OC-PZ-18RSW	Total/NA	Surface Water	SM 2510B	
480-78415-7	OC-SD-17	Total/NA	Surface Water	SM 2510B	
LCS 480-237414/1	Lab Control Sample	Total/NA	Water	SM 2510B	
LCS 480-237414/89	Lab Control Sample	Total/NA	Water	SM 2510B	

Prep Batch: 237653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	Distill/Ammonia	
480-78415-2	OC-ISCO2	Total/NA	Surface Water	Distill/Ammonia	
480-78415-3	OC-ISCO3	Total/NA	Surface Water	Distill/Ammonia	
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	Distill/Ammonia	
480-78415-4 MS	OC-PZ-16RRSW	Total/NA	Surface Water	Distill/Ammonia	
LCS 480-237653/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-237653/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 237654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	Distill/Ammonia	
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	Distill/Ammonia	
480-78415-7	OC-SD-17	Total/NA	Surface Water	Distill/Ammonia	
LCS 480-237654/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-237654/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

General Chemistry (Continued)

Analysis Batch: 237936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-237653/1-A	Lab Control Sample	Total/NA	Water	350.1	237653
LCS 480-237654/1-A	Lab Control Sample	Total/NA	Water	350.1	237654
MB 480-237653/2-A	Method Blank	Total/NA	Water	350.1	237653
MB 480-237654/2-A	Method Blank	Total/NA	Water	350.1	237654

Analysis Batch: 237946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78415-1	OC-ISCO1	Total/NA	Surface Water	350.1	237653
480-78415-2	OC-ISCO2	Total/NA	Surface Water	350.1	237653
480-78415-3	OC-ISCO3	Total/NA	Surface Water	350.1	237653
480-78415-4	OC-PZ-16RRSW	Total/NA	Surface Water	350.1	237653
480-78415-4 MS	OC-PZ-16RRSW	Total/NA	Surface Water	350.1	237653
480-78415-5	OC-PZ-17RRRSW	Total/NA	Surface Water	350.1	237654
480-78415-6	OC-PZ-18RSW	Total/NA	Surface Water	350.1	237654
480-78415-7	OC-SD-17	Total/NA	Surface Water	350.1	237654

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-ISCO1

Lab Sample ID: 480-78415-1

Date Collected: 04/14/15 11:40

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:36	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:18	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:31	LMH	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 03:39	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237653	04/21/15 16:48	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:04	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:23	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:23	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 18:04	KMF	TAL BUF

Client Sample ID: OC-ISCO2

Lab Sample ID: 480-78415-2

Date Collected: 04/14/15 09:55

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:38	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:20	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:34	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237197	04/18/15 09:09	LMH	TAL BUF
Total/NA	Analysis	300.0		100	237298	04/21/15 03:49	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237653	04/21/15 16:48	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:05	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:24	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:24	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-ISCO3

Lab Sample ID: 480-78415-3

Date Collected: 04/14/15 09:40

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:41	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:23	LMH	TAL BUF

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-ISCO3

Lab Sample ID: 480-78415-3

Date Collected: 04/14/15 09:40

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:37	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237197	04/18/15 09:11	LMH	TAL BUF
Total/NA	Analysis	300.0		200	237298	04/21/15 04:04	CAS	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 05:24	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237653	04/21/15 16:48	STD	TAL BUF
Total/NA	Analysis	350.1		1	237946	04/22/15 18:06	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:25	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:25	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-16RRSW

Lab Sample ID: 480-78415-4

Date Collected: 04/14/15 10:25

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:52	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:34	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:40	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237197	04/18/15 09:14	LMH	TAL BUF
Total/NA	Analysis	300.0		200	237298	04/21/15 04:19	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237653	04/21/15 16:48	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:07	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:26	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:26	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-17RRRSW

Lab Sample ID: 480-78415-5

Date Collected: 04/14/15 10:45

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:55	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:37	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-PZ-17RRRSW

Lab Sample ID: 480-78415-5

Date Collected: 04/14/15 10:45

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010		1	237042	04/17/15 19:51	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237197	04/18/15 09:17	LMH	TAL BUF
Total/NA	Analysis	300.0		200	237298	04/21/15 04:33	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237654	04/21/15 17:02	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:11	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:28	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:28	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-18RSW

Lab Sample ID: 480-78415-6

Date Collected: 04/14/15 11:25

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 18:57	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:39	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:54	LMH	TAL BUF
Total/NA	Analysis	300.0		200	237298	04/21/15 04:48	CAS	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 06:28	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237654	04/21/15 17:02	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:12	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:31	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:31	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-SD-17

Lab Sample ID: 480-78415-7

Date Collected: 04/14/15 11:05

Matrix: Surface Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	236879	04/16/15 19:00	AMH	TAL BUF
Dissolved	Prep	3005A			236394	04/15/15 08:02	TAS	TAL BUF
Dissolved	Analysis	6010		1	237032	04/17/15 16:42	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237042	04/17/15 19:57	LMH	TAL BUF
Total/NA	Prep	3005A			236384	04/15/15 08:10	TAS	TAL BUF
Total/NA	Analysis	6010		1	237197	04/18/15 09:28	LMH	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Client Sample ID: OC-SD-17
Date Collected: 04/14/15 11:05
Date Received: 04/15/15 01:35

Lab Sample ID: 480-78415-7
Matrix: Surface Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		200	237298	04/21/15 05:03	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237654	04/21/15 17:02	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:13	KMF	TAL BUF
Total/NA	Analysis	353.2		1	236460	04/15/15 19:32	CLT	TAL BUF
Total/NA	Analysis	353.2		1	236426	04/15/15 19:32	CLT	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Surface Water	Aluminum
6010	3005A	Surface Water	Chromium
6010	3005A	Surface Water	Sodium
SM 2510B		Surface Water	Specific Conductance

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Wilmington MA

TestAmerica Job ID: 480-78415-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-78415-1	OC-ISCO1	Surface Water	04/14/15 11:40	04/15/15 01:35
480-78415-2	OC-ISCO2	Surface Water	04/14/15 09:55	04/15/15 01:35
480-78415-3	OC-ISCO3	Surface Water	04/14/15 09:40	04/15/15 01:35
480-78415-4	OC-PZ-16RRSW	Surface Water	04/14/15 10:25	04/15/15 01:35
480-78415-5	OC-PZ-17RRRSW	Surface Water	04/14/15 10:45	04/15/15 01:35
480-78415-6	OC-PZ-18RSW	Surface Water	04/14/15 11:25	04/15/15 01:35
480-78415-7	OC-SD-17	Surface Water	04/14/15 11:05	04/15/15 01:35

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-78415-1

Login Number: 78415

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
501 Southhampton Rd. Suite C
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-78415 Chain of Custody

Client Information	Sampler: Brian Gaudard	Lab PM: Mason, Becky C
Client Contact: Mr. James Cashwell	Phone: 9786586121	E-Mail: becky.mason@testame
Company: Olin Corporation		
Address: PO BOX 248	Due Date Requested:	
City: Charleston	TAT Requested (days):	
State, Zip: TN, 37310-0248		
Phone: 423-336-4012(Tel)	PO #: REWI0025	
Email: jmcashwell@olin.com	WO #:	
Project Name: Surface Water Quarterly Event Desc: Surfacewater Quarterly (Ma	Project #: 48006612	
Site: Massachusetts	SSOW#:	

Job No: 480-62710-8569.1
Page: Page 1 of 1

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Total Al/Cr/Na	6010MCP - Dissolved Al/Cr/Na	2510B, 353.2, 363.2_Nitrite, Nitrate_Calc	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	D	N		
OC-ISCO1	4-14-15	1140	G	Water	✓		✓	✓	✓	✓	✓	5	
OC-ISCO2	4-14-15	9:55		Water	✓		✓	✓	✓	✓	✓	5	
OC-ISCO3	4-14-15	9:40		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-16RRSW	4-14-15	10:25		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-17~~RRSW~~ RRSW	4-14-15	10:45		Water	✓		✓	✓	✓	✓	✓	5	
OC-PZ-18RSW	4-14-15	11:25		Water	✓		✓	✓	✓	✓	✓	5	
OC-SD-17	4-14-15	11:05		Water	✓		✓	✓	✓	✓	✓	5	
				Water									
				Water									

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:		Date/Time: 4-14-15	Company	Received by:		Date/Time: 4-14-15 1210	Company TA
Relinquished by:		Date/Time: 4-14-15 1700	Company TA	Received by:		Date/Time: 15APR15 0135	Company TAS
Relinquished by:		Date/Time:	Company	Received by:		Date/Time:	Company

Custody Seals Intact: △ Yes △ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 0.7 #1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-78416-1
Client Project/Site: Olin Chemical Wilmington Quarterly
Sampling Event: Groundwater Quarterly (March/August)

For:
AMEC Foster Wheeler E & I, Inc
511 Congress St. Suite 200
Portland, Maine 04101

Attn: Mr. Tige Cunningham

Authorized for release by:
4/30/2015 12:47:04 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Job ID: 480-78416-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 4/15/2015 at 1:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8º C.

Receipt Exceptions
The following sample was submitted for analysis but it was not listed on the Chain-of-Custody (COC): OC-GW-202D Dup (480-78416-11).

HPLC/IC
Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW-25 (480-78416-3), OC-GW-78S (480-78416-4), OC-GW-79S (480-78416-5), OC-PZ-16RR (480-78416-6), OC-PZ-17RRR (480-78416-7), OC-PZ-18R (480-78416-8), OC-PZ-24 (480-78416-9), OC-PZ-25 (480-78416-10), OC-GW-202D Dup (480-78416-11) and (480-78416-D-9 MS). Elevated reporting limits (RLs) are provided.

Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW-202S (480-78416-1), OC-GW-202D (480-78416-2), OC-GW-202D (480-78416-2[MS]), OC-GW-202D (480-78416-2[MSD]) and OC-GW-202D Dup (480-78416-11). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-78416-1**

Project Location: **Olin Chemical Wilmington Quarterly** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-78416-1 [1-11]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	■ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 4/30/15 12:44

This form has been electronically signed and approved.

Detection Summary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-GW-202S — Lab Sample ID: 480-78416-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	2.9	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	130		100	56	mg/L	200		300.0	Total/NA
Sulfate	120	J	400	70	mg/L	200		300.0	Total/NA
Ammonia	29		4.0	2.0	mg/L	20		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	870		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202D — Lab Sample ID: 480-78416-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	260		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	2500		200	60	ug/L	1		6010	Dissolved
Chloride	290	J	500	280	mg/L	1000		300.0	Total/NA
Sulfate	1400	J	2000	350	mg/L	1000		300.0	Total/NA
Ammonia	160		20	10	mg/L	5		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	3600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-25 — Lab Sample ID: 480-78416-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	6.2		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	9.9	J	10	5.6	mg/L	20		300.0	Total/NA
Sulfate	220		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	19		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	970		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-78S — Lab Sample ID: 480-78416-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	2.3	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	16		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	490		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	35		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1400		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-79S — Lab Sample ID: 480-78416-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	6.1		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	140		25	14	mg/L	50		300.0	Total/NA
Sulfate	910		100	17	mg/L	50		300.0	Total/NA
Ammonia	87		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2400		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-PZ-16RR — Lab Sample ID: 480-78416-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	6.1		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	140		25	14	mg/L	50		300.0	Total/NA
Sulfate	920		100	17	mg/L	50		300.0	Total/NA
Ammonia	90		20	10	mg/L	100		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17RRR — Lab Sample ID: 480-78416-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.6		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	16		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	510		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	28		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1500		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18R — Lab Sample ID: 480-78416-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	36		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	650		50	28	mg/L	100		300.0	Total/NA
Sulfate	1900		200	35	mg/L	100		300.0	Total/NA
Ammonia	360		40	20	mg/L	2		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	5600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-24 — Lab Sample ID: 480-78416-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	36		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	28		25	14	mg/L	50		300.0	Total/NA
Sulfate	770		100	17	mg/L	50		300.0	Total/NA
Ammonia	42		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	2000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-25 — Lab Sample ID: 480-78416-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	7.5		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	250		10	5.6	mg/L	20		300.0	Total/NA
Sulfate	45		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	24		10	5.0	mg/L	50		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202D Dup — Lab Sample ID: 480-78416-11

This Detection Summary does not include radiochemical test results.

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-GW-202D Dup (Continued)

Lab Sample ID: 480-78416-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	270		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	2500		200	60	ug/L	1		6010	Dissolved
Chloride	270		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	1400		40	7.0	mg/L	20		300.0	Total/NA
Ammonia	180		20	10	mg/L	2		350.1	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	3600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-GW-202S

Lab Sample ID: 480-78416-1

Date Collected: 04/06/15 10:35

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	2.9	J	5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:00	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		100	56	mg/L			04/21/15 06:31	200
Sulfate	120	J	400	70	mg/L			04/21/15 06:31	200
Ammonia	29		4.0	2.0	mg/L		04/21/15 17:02	04/22/15 18:14	20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	870		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-GW-202D

Lab Sample ID: 480-78416-2

Date Collected: 04/06/15 09:30

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	260		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:02	1
Aluminum	2500		200	60	ug/L		04/16/15 12:05	04/17/15 20:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	290	J	500	280	mg/L			04/21/15 06:45	1000
Sulfate	1400	J	2000	350	mg/L			04/21/15 06:45	1000
Ammonia	160		20	10	mg/L		04/23/15 17:54	04/27/15 15:13	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	3600		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-GW-25

Lab Sample ID: 480-78416-3

Date Collected: 04/07/15 10:20

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	6.2		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:16	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.9	J	10	5.6	mg/L			04/18/15 10:00	20
Sulfate	220		40	7.0	mg/L			04/18/15 10:00	20
Ammonia	19		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:17	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	970		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-GW-78S

Lab Sample ID: 480-78416-4

Date Collected: 04/08/15 09:45

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	2.3	J	5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:27	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16		10	5.6	mg/L			04/18/15 10:20	20
Sulfate	490		40	7.0	mg/L			04/18/15 10:20	20
Ammonia	35		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:18	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1400		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-GW-79S

Lab Sample ID: 480-78416-5

Date Collected: 04/08/15 11:05

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	6.1		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:30	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		25	14	mg/L			04/18/15 10:41	50
Sulfate	910		100	17	mg/L			04/18/15 10:41	50
Ammonia	87		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:21	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2400		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-16RR

Lab Sample ID: 480-78416-6

Date Collected: 04/08/15 11:30

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	6.1		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 21:06	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 21:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		25	14	mg/L			04/18/15 11:02	50
Sulfate	920		100	17	mg/L			04/18/15 11:02	50
Ammonia	90		20	10	mg/L		04/22/15 15:22	04/22/15 18:44	100

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2600		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-17RRR

Lab Sample ID: 480-78416-7

Date Collected: 04/08/15 10:05

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	5.6		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:32	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16		10	5.6	mg/L			04/18/15 11:23	20
Sulfate	510		40	7.0	mg/L			04/18/15 11:23	20
Ammonia	28		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:23	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1500		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-18R

Lab Sample ID: 480-78416-8

Date Collected: 04/07/15 11:10

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	36		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:35	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	650		50	28	mg/L			04/18/15 11:43	100
Sulfate	1900		200	35	mg/L			04/18/15 11:43	100
Ammonia	360		40	20	mg/L		04/23/15 17:54	04/27/15 15:12	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	5600		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-PZ-24

Lab Sample ID: 480-78416-9

Date Collected: 04/06/15 11:55

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	36		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:38	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28		25	14	mg/L			04/18/15 12:04	50
Sulfate	770		100	17	mg/L			04/18/15 12:04	50
Ammonia	42		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:28	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2000		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-PZ-25

Lab Sample ID: 480-78416-10

Date Collected: 04/06/15 11:20

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	7.5		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:41	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 20:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		10	5.6	mg/L			04/18/15 13:29	20
Sulfate	45		40	7.0	mg/L			04/18/15 13:29	20
Ammonia	24		10	5.0	mg/L		04/22/15 15:22	04/22/15 18:29	50

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1100		1.0	1.0	umhos/cm			04/20/15 13:01	1

Client Sample ID: OC-GW-202D Dup

Lab Sample ID: 480-78416-11

Date Collected: 04/06/15 10:35

Matrix: Ground Water

Date Received: 04/15/15 01:35

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	270		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 20:43	1
Aluminum	2500		200	60	ug/L		04/16/15 12:05	04/17/15 20:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	270		2.5	1.4	mg/L			04/18/15 13:49	5
Sulfate	1400		40	7.0	mg/L			04/21/15 07:32	20
Ammonia	180		20	10	mg/L		04/23/15 17:54	04/27/15 15:16	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	3600		1.0	1.0	umhos/cm			04/20/15 13:01	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-236513/1-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		04/16/15 12:05	04/17/15 19:43	1
Aluminum	ND		200	60	ug/L		04/16/15 12:05	04/17/15 19:43	1

Lab Sample ID: LCS 480-236513/2-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	203		ug/L		102	80 - 120
Aluminum	10000	10500		ug/L		105	80 - 120

Lab Sample ID: LCSD 480-236513/3-A
Matrix: Water
Analysis Batch: 237037

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 236513

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	206		ug/L		103	80 - 120	1	20
Aluminum	10000	10700		ug/L		107	80 - 120	1	20

Lab Sample ID: 480-78416-2 MS
Matrix: Ground Water
Analysis Batch: 237037

Client Sample ID: OC-GW-202D
Prep Type: Dissolved
Prep Batch: 236513

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	260		200	458		ug/L		101	75 - 125
Aluminum	2500		10000	12900		ug/L		105	75 - 125

Lab Sample ID: 480-78416-2 MSD
Matrix: Ground Water
Analysis Batch: 237037

Client Sample ID: OC-GW-202D
Prep Type: Dissolved
Prep Batch: 236513

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	260		200	450		ug/L		97	75 - 125	2	20
Aluminum	2500		10000	12600		ug/L		102	75 - 125	2	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-236851/28
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/18/15 01:13	1
Sulfate	ND		2.0	0.35	mg/L			04/18/15 01:13	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 480-236851/52
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/18/15 09:38	1
Sulfate	ND		2.0	0.35	mg/L			04/18/15 09:38	1

Lab Sample ID: LCS 480-236851/27
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.1		mg/L		100	83 - 121
Sulfate	20.0	19.8		mg/L		99	80 - 129

Lab Sample ID: LCS 480-236851/51
Matrix: Water
Analysis Batch: 236851

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.0		mg/L		100	83 - 121
Sulfate	20.0	19.8		mg/L		99	80 - 129

Lab Sample ID: 480-78416-9 MS
Matrix: Ground Water
Analysis Batch: 236851

Client Sample ID: OC-PZ-24
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	28		1250	1250		mg/L		98	83 - 121
Sulfate	770		1250	1940		mg/L		93	80 - 129

Lab Sample ID: MB 480-237298/52
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			04/21/15 06:16	1
Sulfate	ND		2.0	0.35	mg/L			04/21/15 06:16	1

Lab Sample ID: LCS 480-237298/51
Matrix: Water
Analysis Batch: 237298

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	21.6		mg/L		108	83 - 121
Sulfate	20.0	21.6		mg/L		108	80 - 129

Lab Sample ID: 480-78416-2 MS
Matrix: Ground Water
Analysis Batch: 237298

Client Sample ID: OC-GW-202D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	290	J	25000	26500		mg/L		105	83 - 121

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 480-78416-2 MS
Matrix: Ground Water
Analysis Batch: 237298

Client Sample ID: OC-GW-202D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	1400	J	25000	27500		mg/L		104	80 - 129

Lab Sample ID: 480-78416-2 MSD
Matrix: Ground Water
Analysis Batch: 237298

Client Sample ID: OC-GW-202D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	290	J	25000	26500		mg/L		105	83 - 121	0	20
Sulfate	1400	J	25000	27400		mg/L		104	80 - 129	0	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-237654/2-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237654

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/21/15 17:02	04/22/15 16:22	1

Lab Sample ID: LCS 480-237654/1-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237654

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.936		mg/L		94	90 - 110

Lab Sample ID: MB 480-237885/2-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 237885

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/22/15 15:22	04/22/15 16:24	1

Lab Sample ID: LCS 480-237885/1-A
Matrix: Water
Analysis Batch: 237936

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 237885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.990		mg/L		99	90 - 110

Lab Sample ID: 480-78416-7 MS
Matrix: Ground Water
Analysis Batch: 237946

Client Sample ID: OC-PZ-17RRR
Prep Type: Total/NA
Prep Batch: 237885

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	28		0.500	34.0	4	mg/L		1130	90 - 110

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: MB 480-238221/2-A
Matrix: Water
Analysis Batch: 238912

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 238221

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.20	0.10	mg/L		04/23/15 17:54	04/27/15 15:09	1

Lab Sample ID: LCS 480-238221/1-A
Matrix: Water
Analysis Batch: 238912

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 238221

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.04		mg/L		104	90 - 110

Lab Sample ID: 480-78416-2 MS
Matrix: Ground Water
Analysis Batch: 238912

Client Sample ID: OC-GW-202D
Prep Type: Total/NA
Prep Batch: 238221

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	160		10.0	160	4	mg/L		-40	90 - 110

Lab Sample ID: 480-78416-2 MSD
Matrix: Ground Water
Analysis Batch: 238912

Client Sample ID: OC-GW-202D
Prep Type: Total/NA
Prep Batch: 238221

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	160		10.0	181	4	mg/L		170	90 - 110	12	20

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: LCS 480-237414/1
Matrix: Water
Analysis Batch: 237414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	998	1010		umhos/cm		102	90 - 110

Lab Sample ID: LCS 480-237414/23
Matrix: Water
Analysis Batch: 237414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	998	1030		umhos/cm		103	90 - 110

Metals

Prep Batch: 236513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Dissolved	Ground Water	3005A	
480-78416-2	OC-GW-202D	Dissolved	Ground Water	3005A	
480-78416-2 MS	OC-GW-202D	Dissolved	Ground Water	3005A	
480-78416-2 MSD	OC-GW-202D	Dissolved	Ground Water	3005A	
480-78416-3	OC-GW-25	Dissolved	Ground Water	3005A	
480-78416-4	OC-GW-78S	Dissolved	Ground Water	3005A	
480-78416-5	OC-GW-79S	Dissolved	Ground Water	3005A	
480-78416-6	OC-PZ-16RR	Dissolved	Ground Water	3005A	
480-78416-7	OC-PZ-17RRR	Dissolved	Ground Water	3005A	
480-78416-8	OC-PZ-18R	Dissolved	Ground Water	3005A	
480-78416-9	OC-PZ-24	Dissolved	Ground Water	3005A	
480-78416-10	OC-PZ-25	Dissolved	Ground Water	3005A	
480-78416-11	OC-GW-202D Dup	Dissolved	Ground Water	3005A	
LCS 480-236513/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 480-236513/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 480-236513/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 237037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Dissolved	Ground Water	6010	236513
480-78416-2	OC-GW-202D	Dissolved	Ground Water	6010	236513
480-78416-2 MS	OC-GW-202D	Dissolved	Ground Water	6010	236513
480-78416-2 MSD	OC-GW-202D	Dissolved	Ground Water	6010	236513
480-78416-3	OC-GW-25	Dissolved	Ground Water	6010	236513
480-78416-4	OC-GW-78S	Dissolved	Ground Water	6010	236513
480-78416-5	OC-GW-79S	Dissolved	Ground Water	6010	236513
480-78416-6	OC-PZ-16RR	Dissolved	Ground Water	6010	236513
480-78416-7	OC-PZ-17RRR	Dissolved	Ground Water	6010	236513
480-78416-8	OC-PZ-18R	Dissolved	Ground Water	6010	236513
480-78416-9	OC-PZ-24	Dissolved	Ground Water	6010	236513
480-78416-10	OC-PZ-25	Dissolved	Ground Water	6010	236513
480-78416-11	OC-GW-202D Dup	Dissolved	Ground Water	6010	236513
LCS 480-236513/2-A	Lab Control Sample	Total Recoverable	Water	6010	236513
LCSD 480-236513/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	236513
MB 480-236513/1-A	Method Blank	Total Recoverable	Water	6010	236513

General Chemistry

Analysis Batch: 236851

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-3	OC-GW-25	Total/NA	Ground Water	300.0	
480-78416-4	OC-GW-78S	Total/NA	Ground Water	300.0	
480-78416-5	OC-GW-79S	Total/NA	Ground Water	300.0	
480-78416-6	OC-PZ-16RR	Total/NA	Ground Water	300.0	
480-78416-7	OC-PZ-17RRR	Total/NA	Ground Water	300.0	
480-78416-8	OC-PZ-18R	Total/NA	Ground Water	300.0	
480-78416-9	OC-PZ-24	Total/NA	Ground Water	300.0	
480-78416-9 MS	OC-PZ-24	Total/NA	Ground Water	300.0	
480-78416-10	OC-PZ-25	Total/NA	Ground Water	300.0	
480-78416-11	OC-GW-202D Dup	Total/NA	Ground Water	300.0	

General Chemistry (Continued)

Analysis Batch: 236851 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-236851/27	Lab Control Sample	Total/NA	Water	300.0	
LCS 480-236851/51	Lab Control Sample	Total/NA	Water	300.0	
MB 480-236851/28	Method Blank	Total/NA	Water	300.0	
MB 480-236851/52	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 237298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Total/NA	Ground Water	300.0	
480-78416-2	OC-GW-202D	Total/NA	Ground Water	300.0	
480-78416-2 MS	OC-GW-202D	Total/NA	Ground Water	300.0	
480-78416-2 MSD	OC-GW-202D	Total/NA	Ground Water	300.0	
480-78416-11	OC-GW-202D Dup	Total/NA	Ground Water	300.0	
LCS 480-237298/51	Lab Control Sample	Total/NA	Water	300.0	
MB 480-237298/52	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 237414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Total/NA	Ground Water	SM 2510B	
480-78416-2	OC-GW-202D	Total/NA	Ground Water	SM 2510B	
480-78416-3	OC-GW-25	Total/NA	Ground Water	SM 2510B	
480-78416-4	OC-GW-78S	Total/NA	Ground Water	SM 2510B	
480-78416-5	OC-GW-79S	Total/NA	Ground Water	SM 2510B	
480-78416-6	OC-PZ-16RR	Total/NA	Ground Water	SM 2510B	
480-78416-7	OC-PZ-17RRR	Total/NA	Ground Water	SM 2510B	
480-78416-8	OC-PZ-18R	Total/NA	Ground Water	SM 2510B	
480-78416-9	OC-PZ-24	Total/NA	Ground Water	SM 2510B	
480-78416-10	OC-PZ-25	Total/NA	Ground Water	SM 2510B	
480-78416-11	OC-GW-202D Dup	Total/NA	Ground Water	SM 2510B	
LCS 480-237414/1	Lab Control Sample	Total/NA	Water	SM 2510B	
LCS 480-237414/23	Lab Control Sample	Total/NA	Water	SM 2510B	

Prep Batch: 237654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-237654/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-237654/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 237885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-3	OC-GW-25	Total/NA	Ground Water	Distill/Ammonia	
480-78416-4	OC-GW-78S	Total/NA	Ground Water	Distill/Ammonia	
480-78416-5	OC-GW-79S	Total/NA	Ground Water	Distill/Ammonia	
480-78416-6	OC-PZ-16RR	Total/NA	Ground Water	Distill/Ammonia	
480-78416-7	OC-PZ-17RRR	Total/NA	Ground Water	Distill/Ammonia	
480-78416-7 MS	OC-PZ-17RRR	Total/NA	Ground Water	Distill/Ammonia	
480-78416-9	OC-PZ-24	Total/NA	Ground Water	Distill/Ammonia	
480-78416-10	OC-PZ-25	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-237885/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-237885/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

General Chemistry (Continued)

Analysis Batch: 237936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-237654/1-A	Lab Control Sample	Total/NA	Water	350.1	237654
LCS 480-237885/1-A	Lab Control Sample	Total/NA	Water	350.1	237885
MB 480-237654/2-A	Method Blank	Total/NA	Water	350.1	237654
MB 480-237885/2-A	Method Blank	Total/NA	Water	350.1	237885

Analysis Batch: 237946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-1	OC-GW-202S	Total/NA	Ground Water	350.1	237654
480-78416-3	OC-GW-25	Total/NA	Ground Water	350.1	237885
480-78416-4	OC-GW-78S	Total/NA	Ground Water	350.1	237885
480-78416-5	OC-GW-79S	Total/NA	Ground Water	350.1	237885
480-78416-6	OC-PZ-16RR	Total/NA	Ground Water	350.1	237885
480-78416-7	OC-PZ-17RRR	Total/NA	Ground Water	350.1	237885
480-78416-7 MS	OC-PZ-17RRR	Total/NA	Ground Water	350.1	237885
480-78416-9	OC-PZ-24	Total/NA	Ground Water	350.1	237885
480-78416-10	OC-PZ-25	Total/NA	Ground Water	350.1	237885

Prep Batch: 238221

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-2	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
480-78416-2 MS	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
480-78416-2 MSD	OC-GW-202D	Total/NA	Ground Water	Distill/Ammonia	
480-78416-8	OC-PZ-18R	Total/NA	Ground Water	Distill/Ammonia	
480-78416-11	OC-GW-202D Dup	Total/NA	Ground Water	Distill/Ammonia	
LCS 480-238221/1-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 480-238221/2-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 238912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-78416-2	OC-GW-202D	Total/NA	Ground Water	350.1	238221
480-78416-2 MS	OC-GW-202D	Total/NA	Ground Water	350.1	238221
480-78416-2 MSD	OC-GW-202D	Total/NA	Ground Water	350.1	238221
480-78416-8	OC-PZ-18R	Total/NA	Ground Water	350.1	238221
480-78416-11	OC-GW-202D Dup	Total/NA	Ground Water	350.1	238221
LCS 480-238221/1-A	Lab Control Sample	Total/NA	Water	350.1	238221
MB 480-238221/2-A	Method Blank	Total/NA	Water	350.1	238221

Client Sample ID: OC-GW-202S

Lab Sample ID: 480-78416-1

Date Collected: 04/06/15 10:35

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:00	LMH	TAL BUF
Total/NA	Analysis	300.0		200	237298	04/21/15 06:31	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237654	04/21/15 17:02	STD	TAL BUF
Total/NA	Analysis	350.1		20	237946	04/22/15 18:14	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-GW-202D

Lab Sample ID: 480-78416-2

Date Collected: 04/06/15 09:30

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:02	LMH	TAL BUF
Total/NA	Analysis	300.0		1000	237298	04/21/15 06:45	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			238221	04/23/15 17:54	STD	TAL BUF
Total/NA	Analysis	350.1		5	238912	04/27/15 15:13	STD	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-GW-25

Lab Sample ID: 480-78416-3

Date Collected: 04/07/15 10:20

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:16	LMH	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 10:00	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:17	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-GW-78S

Lab Sample ID: 480-78416-4

Date Collected: 04/08/15 09:45

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:27	LMH	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 10:20	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:18	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-GW-79S

Lab Sample ID: 480-78416-5

Date Collected: 04/08/15 11:05

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:30	LMH	TAL BUF
Total/NA	Analysis	300.0		50	236851	04/18/15 10:41	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:21	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-16RR

Lab Sample ID: 480-78416-6

Date Collected: 04/08/15 11:30

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 21:06	LMH	TAL BUF
Total/NA	Analysis	300.0		50	236851	04/18/15 11:02	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		100	237946	04/22/15 18:44	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-17RRR

Lab Sample ID: 480-78416-7

Date Collected: 04/08/15 10:05

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:32	LMH	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 11:23	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:23	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-18R

Lab Sample ID: 480-78416-8

Date Collected: 04/07/15 11:10

Matrix: Ground Water

Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:35	LMH	TAL BUF
Total/NA	Analysis	300.0		100	236851	04/18/15 11:43	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			238221	04/23/15 17:54	STD	TAL BUF
Total/NA	Analysis	350.1		2	238912	04/27/15 15:12	STD	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Lab Chronicle

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Client Sample ID: OC-PZ-24

Lab Sample ID: 480-78416-9

Date Collected: 04/06/15 11:55
Matrix: Ground Water
Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:38	LMH	TAL BUF
Total/NA	Analysis	300.0		50	236851	04/18/15 12:04	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:28	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-PZ-25

Lab Sample ID: 480-78416-10

Date Collected: 04/06/15 11:20
Matrix: Ground Water
Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:41	LMH	TAL BUF
Total/NA	Analysis	300.0		20	236851	04/18/15 13:29	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			237885	04/22/15 15:22	STD	TAL BUF
Total/NA	Analysis	350.1		50	237946	04/22/15 18:29	KMF	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Client Sample ID: OC-GW-202D Dup

Lab Sample ID: 480-78416-11

Date Collected: 04/06/15 10:35
Matrix: Ground Water
Date Received: 04/15/15 01:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			236513	04/16/15 12:05	TAS	TAL BUF
Dissolved	Analysis	6010		1	237037	04/17/15 20:43	LMH	TAL BUF
Total/NA	Analysis	300.0		20	237298	04/21/15 07:32	CAS	TAL BUF
Total/NA	Analysis	300.0		5	236851	04/18/15 13:49	CAS	TAL BUF
Total/NA	Prep	Distill/Ammonia			238221	04/23/15 17:54	STD	TAL BUF
Total/NA	Analysis	350.1		2	238912	04/27/15 15:16	STD	TAL BUF
Total/NA	Analysis	SM 2510B		1	237414	04/20/15 13:01	KMF	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Ground Water	Aluminum
6010	3005A	Ground Water	Chromium
SM 2510B		Ground Water	Specific Conductance

Method Summary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: AMEC Foster Wheeler E & I, Inc
Project/Site: Olin Chemical Wilmington Quarterly

TestAmerica Job ID: 480-78416-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-78416-1	OC-GW-202S	Ground Water	04/06/15 10:35	04/15/15 01:35
480-78416-2	OC-GW-202D	Ground Water	04/06/15 09:30	04/15/15 01:35
480-78416-3	OC-GW-25	Ground Water	04/07/15 10:20	04/15/15 01:35
480-78416-4	OC-GW-78S	Ground Water	04/08/15 09:45	04/15/15 01:35
480-78416-5	OC-GW-79S	Ground Water	04/08/15 11:05	04/15/15 01:35
480-78416-6	OC-PZ-16RR	Ground Water	04/08/15 11:30	04/15/15 01:35
480-78416-7	OC-PZ-17RRR	Ground Water	04/08/15 10:05	04/15/15 01:35
480-78416-8	OC-PZ-18R	Ground Water	04/07/15 11:10	04/15/15 01:35
480-78416-9	OC-PZ-24	Ground Water	04/06/15 11:55	04/15/15 01:35
480-78416-10	OC-PZ-25	Ground Water	04/06/15 11:20	04/15/15 01:35
480-78416-11	OC-GW-202D Dup	Ground Water	04/06/15 10:35	04/15/15 01:35

Login Sample Receipt Checklist

Client: AMEC Foster Wheeler E & I, Inc

Job Number: 480-78416-1

Login Number: 78416

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	False	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

TestAmerica Westfield
501 Southhampton Rd. Suite C
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: -8566.1
Client Contact: Mr. James Cashwell	Phone:	E-Mail: becky.mason@testamericainc.		
Company: Olin Corporation			480-78416 Chain of Custody	
Address: PO BOX 248	Due Date Requested:			
City: Charleston	TAT Requested (days):			
State, Zip: TN, 37310-0248				
Phone: 423-336-4012(Tel)	PO #: REWI0025			
Email: jmcashwell@olin.com	WO #:			
Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (Marc	Project #: 48006612			
Site: Massachusetts	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0_28D - Sulfate/Chloride	350.1 - Ammonia	6010MCP - Dissolved Al/Cr	2510B - Specific Conductance											Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	N												
OC-GW-202S	4-6-15	10:35	G	Water	✓		X	X	X	X											4	
OC-GW-202D	4-6-15	9:30	G	Water	✓	✓	X	X	X	X											16	
OC-GW-25	4-7-15	10:20	G	Water	✓		X	X	X	X											4	
OC-GW-78S	4-8-15	9:45	G	Water	✓		X	X	X	X											4	
OC-GW-79S	4-8-15	11:05	G	Water	✓		X	X	X	X											4	
OC-PZ-16RR	4-8-15	11:30	G	Water	✓		X	X	X	X											4	
OC-PZ-17RR2	4-8-15	10:05	G	Water	✓		X	X	X	X											4	
OC-PZ-18R	4-7-15	11:10	G	Water	✓		X	X	X	X											4	
PZ-24	4-6-15	11:55	G	Water	✓		X	X	X	X											4	
PZ-25	4-6-15	11:20	G	Water	✓		X	X	X	X											4	
				Water																		

Container Codes:

C - Zn Acetate	M - Hexane
D - Nitric Acid	N - None
E - NaHSO4	O - AsNaO2
F - MeOH	P - Na2O4S
G - Amchlor	Q - Na2SO3
H - Ascorbic Acid	R - Na2S2SO3
I - Ice	S - H2SO4
J - DI Water	T - TSP Dodecahydrate
K - EDTA	U - Acetone
L - EDA	V - MCAA
Other:	W - ph 4-5
	Z - other (specify)

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		4-14-15			4-14-15 1235	TA
2		4-15-15 1700	TA		15APR15 0135	TMS
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 6.8 #1

To: James Cashwell
From: Chris Ricardi
Date: January 21, 2015
Subject: Calcium Sulfate Landfill Semi-Annual Monitoring – November 2014

DATA VALIDATION REPORT
NOVEMBER 2014 CALCIUM SULFATE LANDFILL GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Set: 480-71174-1

1.0 INTRODUCTION

Groundwater samples were collected from the Olin Chemical Superfund Site on November 10, 2014. Samples were analyzed by TestAmerica Laboratories in Buffalo, New York. Data were reported in sample delivery group (SDG) 480-71174-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following U.S. Environmental Protection Agency (USEPA) SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- Total metals (aluminum, calcium, chromium, iron, manganese, nickel, and sodium) by USEPA Method 6010B
- General chemistry analyses for total alkalinity, carbonate and bicarbonate alkalinity by SM 2320B, chloride and sulfate by USEPA Method E300, and total dissolved solids (TDS) by SM A2540C

The Draft Post Closure Plan (MACTEC, 2006) and the Massachusetts Department of Environmental Protection (MassDEP) Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2.

2.0 METALS

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Matrix Spike Analysis
* Field Duplicate Results
* Laboratory Control Sample
* Detection limits

AMEC Environment & Infrastructure, Inc.
Quorum Office Park, 271 Mill Road
Chelmsford, Massachusetts 01824 USA
Tel: 978.692.9090 • Fax: 978.692.6633

***** = indicates that criteria were met for this parameter

3.0 GENERAL CHEMISTRY – Carbonate and Bicarbonate Alkalinity, Chloride, Sulfate, and Total Dissolved Solids

The data were evaluated based on the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Matrix Spike Analysis
* Laboratory Duplicate Analysis
* Field Duplicate Analysis
* Laboratory Control Sample
* Detection limits

***** **=** indicates that criteria were met for this parameter

The results are interpreted to be usable as reported by TestAmerica.

Chris Ricardi, NRCC-EAC
Senior Chemist

1/21/15
Date

Michael Murphy
Project Principal

1/21/15
Date

\\WFD-fs1\projects\old_Wakefield_Data\projects\6107140016 - Olin Wilmington CSS 2014\3.0 Field and Site Characterization\3.4 Test Results\3.4.1 Data Validation\November 2014 CSL\DRAFT_Memo_CaSulf_Landfill_ Nov2014 val report.docx

References:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2006. "Draft Calcium Sulfate Landfill Post Closure Monitoring Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; December, 2006.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July 2010.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

USEPA, 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary
Data Validation Report
November 2014 Calcium Sulfate Landfill Sampling
Olin Chemical Superfund Site
Wilmington, Massachusetts

					Method Class	Alkalinity	TDS	Anions	Metals
					Analysis Method	A2320	A2540C	E300	SW6010
					Fraction	T	T	T	T
Lab SDG	**Location**	**Field Sample ID**	**Field Sample Date**	**Qc Code**	**Media**				
480-71174-1	SL-1D	OC-SL1D	11/10/2014	FS	GW	3	1	2	7
480-71174-1	SL-2	OC-SL2	11/10/2014	FS	GW	3	1	2	7
480-71174-1	SL-3	OC-SL3	11/10/2014	FS	GW	3	1	2	7
480-71174-1	SL-3	OC-SLDUP	11/10/2014	FD	GW	3	1	2	7
480-71174-1	SL-6	OC-SL6	11/10/2014	FS	GW	3	1	2	7

Notes:
FS = Field Sample
FD = Field Duplicate
GW = Groundwater
T = Total
TDS = total dissolved solids
Anions includes chloride and sulfate

Table 2
Final Sample Results
Data Validation Report
November 2014 Calcium Sulfate Landfill Sampling
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group	480-71174-1		480-71174-1		480-71174-1		480-71174-1		480-71174-1	
		Location	SL-1D		SL-2		SL-3		SL-3		SL-6	
		Field Sample Date	11/10/2014		11/10/2014		11/10/2014		11/10/2014		11/10/2014	
		Field Sample Id	OC-SL1D		OC-SL2		OC-SL3		OC-SLDUP		OC-SL6	
		Qc Code	FS		FS		FS		FD		FS	
Method	**Fraction**	**Parameter**	**Units**	Result Qualifier	Result Qualifier		Result Qualifier		Result Qualifier		Result Qualifier	
SW6010	T	Aluminum	ug/l	220	200 U		200 U		200 U		130 J	
SW6010	T	Calcium	ug/l	39,000	37,000		250,000		240,000		370,000	
SW6010	T	Chromium	ug/l	5 U	5 U		1.6 J		1.6 J		1.5 J	
SW6010	T	Iron	ug/l	260	110		51,000		51,000		550	
SW6010	T	Manganese	ug/l	29	6.1		4,400		4,300		2,500	
SW6010	T	Nickel	ug/l	10 U	10 U		2 J		2 J		10 U	
SW6010	T	Sodium	ug/l	47,000	18,000		8,600		8,600		11,000	
A2320	T	Bicarbonate Alkalinity, as CaCO3	mg/l	24	18		370		370		180	
A2320	T	Carbonate Alkalinity, as CaCO3	mg/l	5 U	5 U		5 U		5 U		5 U	
A2320	T	Total Alkalinity, as CaCO3	mg/l	24	18		370		370		180	
A2540C	T	Total Dissolved Solids	mg/l	220	36		770		830		1,400	
E300	T	Chloride	mg/l	21	7.4		6.3		0.5 U		0.5 U	
E300	T	Sulfate	mg/l	4.9	14		350		2 U		45	

Notes:
FS = Field Sample
FD = Field Duplicate
T = Total
ug/l = Micrograms per liter
mg/l = Milligrams per liter

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-71174-1
Client Project/Site: Olin Chemical Calcium Sulfate landfill
Revision: 1

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/16/2015 4:19:35 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-71174-1

Laboratory: TestAmerica Buffalo

Narrative

Revised report: OC was missing from ID for all samples.

Receipt

The samples were received on 11/12/2014 1:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

HPLC/IC

Method 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: (480-71405-2 MS), Broadstone-Groton-Kitchen (480-71405-2), SL3 (480-71174-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-71174-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

480-71174-1[1-5]

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

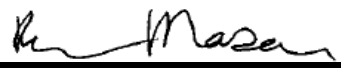
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Project Manager

Printed Name: Becky Mason Date: 12/3/14 13:45

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Client Sample ID: OC-SL3 — Lab Sample ID: 480-71174-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.6	J	5.0	1.0	ug/L	1		6010	Total/NA
Nickel	2.0	J	10	1.3	ug/L	1		6010	Total/NA
Calcium	250000	B	500	100	ug/L	1		6010	Total/NA
Manganese	4400		3.0	0.40	ug/L	1		6010	Total/NA
Sodium	8600		1000	320	ug/L	1		6010	Total/NA
Iron	51000		50	19	ug/L	1		6010	Total/NA
Chloride	6.3		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	350		20	3.5	mg/L	10		300.0	Total/NA
Alkalinity, Total	370		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Alkalinity, Bicarbonate	370		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	770		10	4.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: OC-SL6 — Lab Sample ID: 480-71174-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.5	J	5.0	1.0	ug/L	1		6010	Total/NA
Aluminum	130	J	200	60	ug/L	1		6010	Total/NA
Calcium	370000	B	500	100	ug/L	1		6010	Total/NA
Manganese	2500		3.0	0.40	ug/L	1		6010	Total/NA
Sodium	11000		1000	320	ug/L	1		6010	Total/NA
Iron	550		50	19	ug/L	1		6010	Total/NA
Sulfate	45		2.0	0.35	mg/L	1		300.0	Total/NA
Alkalinity, Total	180		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Alkalinity, Bicarbonate	180		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1400		10	4.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: OC-SL2 — Lab Sample ID: 480-71174-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	37000	B	500	100	ug/L	1		6010	Total/NA
Manganese	6.1		3.0	0.40	ug/L	1		6010	Total/NA
Sodium	18000		1000	320	ug/L	1		6010	Total/NA
Iron	110		50	19	ug/L	1		6010	Total/NA
Chloride	7.4		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	14		2.0	0.35	mg/L	1		300.0	Total/NA
Alkalinity, Total	18		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Alkalinity, Bicarbonate	18		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	36		10	4.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: OC-SL1D — Lab Sample ID: 480-71174-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	220		200	60	ug/L	1		6010	Total/NA
Calcium	39000	B	500	100	ug/L	1		6010	Total/NA
Manganese	29		3.0	0.40	ug/L	1		6010	Total/NA
Sodium	47000		1000	320	ug/L	1		6010	Total/NA
Iron	260		50	19	ug/L	1		6010	Total/NA
Chloride	21		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	4.9		2.0	0.35	mg/L	1		300.0	Total/NA
Alkalinity, Total	24		5.0	0.79	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Client Sample ID: OC-SL1D (Continued)

Lab Sample ID: 480-71174-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity, Bicarbonate	24		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	220		10	4.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: OC-SLDUP

Lab Sample ID: 480-71174-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.6	J	5.0	1.0	ug/L	1		6010	Total/NA
Nickel	2.0	J	10	1.3	ug/L	1		6010	Total/NA
Calcium	240000	B	500	100	ug/L	1		6010	Total/NA
Manganese	4300		3.0	0.40	ug/L	1		6010	Total/NA
Sodium	8600		1000	320	ug/L	1		6010	Total/NA
Iron	51000		50	19	ug/L	1		6010	Total/NA
Alkalinity, Total	370		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Alkalinity, Bicarbonate	370		5.0	0.79	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	830		10	4.0	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-SL3

Date Collected: 11/10/14 10:25
Date Received: 11/12/14 01:00

Lab Sample ID: 480-71174-1
Matrix: Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.6	J	5.0	1.0	ug/L		11/13/14 08:23	11/13/14 21:30	1
Nickel	2.0	J	10	1.3	ug/L		11/13/14 08:23	11/13/14 21:30	1
Aluminum	ND		200	60	ug/L		11/13/14 08:23	11/13/14 21:30	1
Calcium	250000	B	500	100	ug/L		11/13/14 08:23	11/13/14 21:30	1
Manganese	4400		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 21:30	1
Sodium	8600		1000	320	ug/L		11/13/14 08:23	11/13/14 21:30	1
Iron	51000		50	19	ug/L		11/13/14 08:23	11/13/14 21:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.3		5.0	2.8	mg/L			11/25/14 20:40	10
Sulfate	350		20	3.5	mg/L			11/25/14 20:40	10
Alkalinity, Total	370		5.0	0.79	mg/L			11/13/14 02:36	1
Alkalinity, Bicarbonate	370		5.0	0.79	mg/L			11/13/14 02:36	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 02:36	1
Total Dissolved Solids	770		10	4.0	mg/L			11/17/14 21:45	1

Client Sample ID: OC-SL6

Date Collected: 11/10/14 09:25
Date Received: 11/12/14 01:00

Lab Sample ID: 480-71174-2
Matrix: Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.5	J	5.0	1.0	ug/L		11/13/14 08:23	11/13/14 21:39	1
Nickel	ND		10	1.3	ug/L		11/13/14 08:23	11/13/14 21:39	1
Aluminum	130	J	200	60	ug/L		11/13/14 08:23	11/13/14 21:39	1
Calcium	370000	B	500	100	ug/L		11/13/14 08:23	11/13/14 21:39	1
Manganese	2500		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 21:39	1
Sodium	11000		1000	320	ug/L		11/13/14 08:23	11/13/14 21:39	1
Iron	550		50	19	ug/L		11/13/14 08:23	11/13/14 21:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/24/14 20:47	1
Sulfate	45		2.0	0.35	mg/L			11/24/14 20:47	1
Alkalinity, Total	180		5.0	0.79	mg/L			11/13/14 02:56	1
Alkalinity, Bicarbonate	180		5.0	0.79	mg/L			11/13/14 02:56	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 02:56	1
Total Dissolved Solids	1400		10	4.0	mg/L			11/17/14 21:45	1

Client Sample ID: OC-SL2

Date Collected: 11/10/14 11:40
Date Received: 11/12/14 01:00

Lab Sample ID: 480-71174-3
Matrix: Water

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/13/14 08:23	11/13/14 21:50	1
Nickel	ND		10	1.3	ug/L		11/13/14 08:23	11/13/14 21:50	1
Aluminum	ND		200	60	ug/L		11/13/14 08:23	11/13/14 21:50	1
Calcium	37000	B	500	100	ug/L		11/13/14 08:23	11/13/14 21:50	1

Client Sample ID: OC-SL2

Lab Sample ID: 480-71174-3

Date Collected: 11/10/14 11:40

Matrix: Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	6.1		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 21:50	1
Sodium	18000		1000	320	ug/L		11/13/14 08:23	11/13/14 21:50	1
Iron	110		50	19	ug/L		11/13/14 08:23	11/13/14 21:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.4		0.50	0.28	mg/L			11/24/14 20:57	1
Sulfate	14		2.0	0.35	mg/L			11/24/14 20:57	1
Alkalinity, Total	18		5.0	0.79	mg/L			11/13/14 03:00	1
Alkalinity, Bicarbonate	18		5.0	0.79	mg/L			11/13/14 03:00	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 03:00	1
Total Dissolved Solids	36		10	4.0	mg/L			11/17/14 21:45	1

Client Sample ID: OC-SL1D

Lab Sample ID: 480-71174-4

Date Collected: 11/10/14 12:15

Matrix: Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/13/14 08:23	11/13/14 21:53	1
Nickel	ND		10	1.3	ug/L		11/13/14 08:23	11/13/14 21:53	1
Aluminum	220		200	60	ug/L		11/13/14 08:23	11/13/14 21:53	1
Calcium	39000	B	500	100	ug/L		11/13/14 08:23	11/13/14 21:53	1
Manganese	29		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 21:53	1
Sodium	47000		1000	320	ug/L		11/13/14 08:23	11/13/14 21:53	1
Iron	260		50	19	ug/L		11/13/14 08:23	11/13/14 21:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21		0.50	0.28	mg/L			11/24/14 21:07	1
Sulfate	4.9		2.0	0.35	mg/L			11/24/14 21:07	1
Alkalinity, Total	24		5.0	0.79	mg/L			11/13/14 03:07	1
Alkalinity, Bicarbonate	24		5.0	0.79	mg/L			11/13/14 03:07	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 03:07	1
Total Dissolved Solids	220		10	4.0	mg/L			11/17/14 21:45	1

Client Sample ID: OC-SLDUP

Lab Sample ID: 480-71174-5

Date Collected: 11/10/14 10:25

Matrix: Water

Date Received: 11/12/14 01:00

Method: 6010 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.6	J	5.0	1.0	ug/L		11/13/14 08:23	11/13/14 21:56	1
Nickel	2.0	J	10	1.3	ug/L		11/13/14 08:23	11/13/14 21:56	1
Aluminum	ND		200	60	ug/L		11/13/14 08:23	11/13/14 21:56	1
Calcium	240000	B	500	100	ug/L		11/13/14 08:23	11/13/14 21:56	1
Manganese	4300		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 21:56	1
Sodium	8600		1000	320	ug/L		11/13/14 08:23	11/13/14 21:56	1
Iron	51000		50	19	ug/L		11/13/14 08:23	11/13/14 21:56	1

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Client Sample ID: OC-SLDUP
Date Collected: 11/10/14 10:25
Date Received: 11/12/14 01:00

Lab Sample ID: 480-71174-5
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/24/14 22:00	1
Sulfate	ND		2.0	0.35	mg/L			11/24/14 22:00	1
Alkalinity, Total	**370**		5.0	0.79	mg/L			11/13/14 03:13	1
Alkalinity, Bicarbonate	**370**		5.0	0.79	mg/L			11/13/14 03:13	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 03:13	1
Total Dissolved Solids	**830**		10	4.0	mg/L			11/17/14 21:45	1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-213639/1-A
Matrix: Water
Analysis Batch: 214065

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 213639

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		11/13/14 08:23	11/13/14 20:42	1
Nickel	ND		10	1.3	ug/L		11/13/14 08:23	11/13/14 20:42	1
Aluminum	ND		200	60	ug/L		11/13/14 08:23	11/13/14 20:42	1
Calcium	115	J	500	100	ug/L		11/13/14 08:23	11/13/14 20:42	1
Manganese	ND		3.0	0.40	ug/L		11/13/14 08:23	11/13/14 20:42	1
Sodium	ND		1000	320	ug/L		11/13/14 08:23	11/13/14 20:42	1
Iron	ND		50	19	ug/L		11/13/14 08:23	11/13/14 20:42	1

Lab Sample ID: LCS 480-213639/2-A
Matrix: Water
Analysis Batch: 214065

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 213639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	202		ug/L		101	80 - 120
Nickel	200	201		ug/L		101	80 - 120
Aluminum	10000	10300		ug/L		103	80 - 120
Calcium	10000	9840		ug/L		98	80 - 120
Manganese	200	202		ug/L		101	80 - 120
Sodium	10000	10200		ug/L		101	80 - 120
Iron	10000	9930		ug/L		99	80 - 120

Lab Sample ID: LCSD 480-213639/3-A
Matrix: Water
Analysis Batch: 214065

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 213639

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	201		ug/L		101	80 - 120	0	20
Nickel	200	201		ug/L		101	80 - 120	0	20
Aluminum	10000	10300		ug/L		103	80 - 120	0	20
Calcium	10000	9720		ug/L		97	80 - 120	1	20
Manganese	200	200		ug/L		100	80 - 120	1	20
Sodium	10000	10100		ug/L		101	80 - 120	1	20
Iron	10000	9820		ug/L		98	80 - 120	1	20

Lab Sample ID: 480-71174-1 MS
Matrix: Water
Analysis Batch: 214065

Client Sample ID: OC-SL3
Prep Type: Total/NA
Prep Batch: 213639

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	1.6	J	200	202		ug/L		100	75 - 125
Nickel	2.0	J	200	211		ug/L		105	75 - 125
Aluminum	ND		10000	10500		ug/L		105	75 - 125
Calcium	250000	B	10000	256000	4	ug/L		92	75 - 125
Manganese	4400		200	4590	4	ug/L		117	75 - 125
Sodium	8600		10000	19100		ug/L		105	75 - 125
Iron	51000		10000	61900	4	ug/L		106	75 - 125

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 480-71174-1 MSD — **Client Sample ID: OC-SL3**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 214065 — **Prep Batch: 213639**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	1.6	J	200	200		ug/L		99	75 - 125	1	20
Nickel	2.0	J	200	211		ug/L		104	75 - 125	0	20
Aluminum	ND		10000	10600		ug/L		106	75 - 125	0	20
Calcium	250000	B	10000	254000	4	ug/L		75	75 - 125	1	20
Manganese	4400		200	4590	4	ug/L		119	75 - 125	0	20
Sodium	8600		10000	19000		ug/L		104	75 - 125	1	20
Iron	51000		10000	62800	4	ug/L		115	75 - 125	1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-215650/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215650

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/24/14 17:04	1
Sulfate	ND		2.0	0.35	mg/L			11/24/14 17:04	1

Lab Sample ID: LCS 480-215650/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215650

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.9		mg/L		100	83 - 121
Sulfate	20.0	20.0		mg/L		100	80 - 129

Lab Sample ID: 480-71174-1 MS — **Client Sample ID: OC-SL3**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215650

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	6.4		25.0	31.6		mg/L		101	83 - 121

Lab Sample ID: 480-71174-1 MSD — **Client Sample ID: OC-SL3**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215650

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	6.4		25.0	30.5		mg/L		96	83 - 121	4	20

Lab Sample ID: MB 480-215652/32 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 215652

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/24/14 21:50	1
Sulfate	ND		2.0	0.35	mg/L			11/24/14 21:50	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-215652/31
Matrix: Water
Analysis Batch: 215652

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.0		mg/L		100	83 - 121
Sulfate	20.0	19.8		mg/L		99	80 - 129

Lab Sample ID: MB 480-215961/4
Matrix: Water
Analysis Batch: 215961

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/25/14 18:08	1
Sulfate	ND		2.0	0.35	mg/L			11/25/14 18:08	1

Lab Sample ID: LCS 480-215961/3
Matrix: Water
Analysis Batch: 215961

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.1		mg/L		101	83 - 121
Sulfate	20.0	20.0		mg/L		100	80 - 129

Lab Sample ID: MB 480-216163/4
Matrix: Water
Analysis Batch: 216163

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			11/26/14 16:11	1
Sulfate	ND		2.0	0.35	mg/L			11/26/14 16:11	1

Lab Sample ID: LCS 480-216163/3
Matrix: Water
Analysis Batch: 216163

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.2		mg/L		101	83 - 121
Sulfate	20.0	20.0		mg/L		100	80 - 129

Lab Sample ID: 480-71174-1 MS
Matrix: Water
Analysis Batch: 216163

Client Sample ID: OC-SL3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	350		250	600		mg/L		99	80 - 129

Lab Sample ID: 480-71174-1 MSD
Matrix: Water
Analysis Batch: 216163

Client Sample ID: OC-SL3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	350		250	604		mg/L		101	80 - 129	1	20

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-213772/6
Matrix: Water
Analysis Batch: 213772

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity, Total	ND		5.0	0.79	mg/L			11/13/14 02:19	1
Alkalinity, Bicarbonate	ND		5.0	0.79	mg/L			11/13/14 02:19	1
Alkalinity, Carbonate	ND		5.0	0.79	mg/L			11/13/14 02:19	1

Lab Sample ID: LCS 480-213772/7
Matrix: Water
Analysis Batch: 213772

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity, Total			100	96.4		mg/L		96	90 - 110		

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 480-214578/1
Matrix: Water
Analysis Batch: 214578

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	4.0	mg/L			11/17/14 21:45	1

Lab Sample ID: LCS 480-214578/2
Matrix: Water
Analysis Batch: 214578

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			504	469		mg/L		93	85 - 115		

Lab Sample ID: 480-71174-5 DU
Matrix: Water
Analysis Batch: 214578

Client Sample ID: OC-SLDUP
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	830			902		mg/L				9	20

Metals

Prep Batch: 213639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1	OC-SL3	Total/NA	Water	3005A	
480-71174-1 MS	OC-SL3	Total/NA	Water	3005A	
480-71174-1 MSD	OC-SL3	Total/NA	Water	3005A	
480-71174-2	OC-SL6	Total/NA	Water	3005A	
480-71174-3	OC-SL2	Total/NA	Water	3005A	
480-71174-4	OC-SL1D	Total/NA	Water	3005A	
480-71174-5	OC-SLDUP	Total/NA	Water	3005A	
LCS 480-213639/2-A	Lab Control Sample	Total/NA	Water	3005A	
LCSD 480-213639/3-A	Lab Control Sample Dup	Total/NA	Water	3005A	
MB 480-213639/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 214065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1	OC-SL3	Total/NA	Water	6010	213639
480-71174-1 MS	OC-SL3	Total/NA	Water	6010	213639
480-71174-1 MSD	OC-SL3	Total/NA	Water	6010	213639
480-71174-2	OC-SL6	Total/NA	Water	6010	213639
480-71174-3	OC-SL2	Total/NA	Water	6010	213639
480-71174-4	OC-SL1D	Total/NA	Water	6010	213639
480-71174-5	OC-SLDUP	Total/NA	Water	6010	213639
LCS 480-213639/2-A	Lab Control Sample	Total/NA	Water	6010	213639
LCSD 480-213639/3-A	Lab Control Sample Dup	Total/NA	Water	6010	213639
MB 480-213639/1-A	Method Blank	Total/NA	Water	6010	213639

General Chemistry

Analysis Batch: 213772

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1	OC-SL3	Total/NA	Water	SM 2320B	
480-71174-2	OC-SL6	Total/NA	Water	SM 2320B	
480-71174-3	OC-SL2	Total/NA	Water	SM 2320B	
480-71174-4	OC-SL1D	Total/NA	Water	SM 2320B	
480-71174-5	OC-SLDUP	Total/NA	Water	SM 2320B	
LCS 480-213772/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-213772/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 214578

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1	OC-SL3	Total/NA	Water	SM 2540C	
480-71174-2	OC-SL6	Total/NA	Water	SM 2540C	
480-71174-3	OC-SL2	Total/NA	Water	SM 2540C	
480-71174-4	OC-SL1D	Total/NA	Water	SM 2540C	
480-71174-5	OC-SLDUP	Total/NA	Water	SM 2540C	
480-71174-5 DU	OC-SLDUP	Total/NA	Water	SM 2540C	
LCS 480-214578/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 480-214578/1	Method Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 215650

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1 MS	OC-SL3	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 215650 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1 MSD	OC-SL3	Total/NA	Water	300.0	
480-71174-2	OC-SL6	Total/NA	Water	300.0	
480-71174-3	OC-SL2	Total/NA	Water	300.0	
480-71174-4	OC-SL1D	Total/NA	Water	300.0	
LCS 480-215650/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215650/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 215652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-5	OC-SLDUP	Total/NA	Water	300.0	
LCS 480-215652/31	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215652/32	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 215961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1	OC-SL3	Total/NA	Water	300.0	
LCS 480-215961/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-215961/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 216163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-71174-1 MS	OC-SL3	Total/NA	Water	300.0	
480-71174-1 MSD	OC-SL3	Total/NA	Water	300.0	
LCS 480-216163/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-216163/4	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Client Sample ID: OC-SL3

Lab Sample ID: 480-71174-1

Date Collected: 11/10/14 10:25

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			213639	11/13/14 08:23	TRP	TAL BUF
Total/NA	Analysis	6010		1	214065	11/13/14 21:30	AMH	TAL BUF
Total/NA	Analysis	300.0		10	215961	11/25/14 20:40	NDB	TAL BUF
Total/NA	Analysis	SM 2320B		1	213772	11/13/14 02:36	VAJ	TAL BUF
Total/NA	Analysis	SM 2540C		1	214578	11/17/14 21:45	JMB	TAL BUF

Client Sample ID: OC-SL6

Lab Sample ID: 480-71174-2

Date Collected: 11/10/14 09:25

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			213639	11/13/14 08:23	TRP	TAL BUF
Total/NA	Analysis	6010		1	214065	11/13/14 21:39	AMH	TAL BUF
Total/NA	Analysis	300.0		1	215650	11/24/14 20:47	NDB	TAL BUF
Total/NA	Analysis	SM 2320B		1	213772	11/13/14 02:56	VAJ	TAL BUF
Total/NA	Analysis	SM 2540C		1	214578	11/17/14 21:45	JMB	TAL BUF

Client Sample ID: OC-SL2

Lab Sample ID: 480-71174-3

Date Collected: 11/10/14 11:40

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			213639	11/13/14 08:23	TRP	TAL BUF
Total/NA	Analysis	6010		1	214065	11/13/14 21:50	AMH	TAL BUF
Total/NA	Analysis	300.0		1	215650	11/24/14 20:57	NDB	TAL BUF
Total/NA	Analysis	SM 2320B		1	213772	11/13/14 03:00	VAJ	TAL BUF
Total/NA	Analysis	SM 2540C		1	214578	11/17/14 21:45	JMB	TAL BUF

Client Sample ID: OC-SL1D

Lab Sample ID: 480-71174-4

Date Collected: 11/10/14 12:15

Matrix: Water

Date Received: 11/12/14 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			213639	11/13/14 08:23	TRP	TAL BUF
Total/NA	Analysis	6010		1	214065	11/13/14 21:53	AMH	TAL BUF
Total/NA	Analysis	300.0		1	215650	11/24/14 21:07	NDB	TAL BUF
Total/NA	Analysis	SM 2320B		1	213772	11/13/14 03:07	VAJ	TAL BUF
Total/NA	Analysis	SM 2540C		1	214578	11/17/14 21:45	JMB	TAL BUF

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Client Sample ID: OC-SLDUP
Date Collected: 11/10/14 10:25
Date Received: 11/12/14 01:00

Lab Sample ID: 480-71174-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			213639	11/13/14 08:23	TRP	TAL BUF
Total/NA	Analysis	6010		1	214065	11/13/14 21:56	AMH	TAL BUF
Total/NA	Analysis	300.0		1	215652	11/24/14 22:00	NDB	TAL BUF
Total/NA	Analysis	SM 2320B		1	213772	11/13/14 03:13	VAJ	TAL BUF
Total/NA	Analysis	SM 2540C		1	214578	11/17/14 21:45	JMB	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6010	3005A	Water	Aluminum
6010	3005A	Water	Calcium
6010	3005A	Water	Chromium
6010	3005A	Water	Iron
6010	3005A	Water	Manganese
6010	3005A	Water	Nickel
6010	3005A	Water	Sodium

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Calcium Sulfate landfill

TestAmerica Job ID: 480-71174-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-71174-1	OC-SL3	Water	11/10/14 10:25	11/12/14 01:00
480-71174-2	OC-SL6	Water	11/10/14 09:25	11/12/14 01:00
480-71174-3	OC-SL2	Water	11/10/14 11:40	11/12/14 01:00
480-71174-4	OC-SL1D	Water	11/10/14 12:15	11/12/14 01:00
480-71174-5	OC-SLDUP	Water	11/10/14 10:25	11/12/14 01:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-71174-1

Login Number: 71174

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OLIN CORP.
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 360-17708-3909.1
Client Contact: Mr. Brian Guichard	Phone: 9786586141	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone: 423-336-4012(Tel)	PO #: REWI0013			
Email: beguichard@olin.com	WO #:			
Project Name: Olin Chemical Superfund Site	Project #: 36001816			
Site: Calcium Sulfate land fill	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B - (MOD) Custom Pick List D	2320B, 300.0_28D N	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
SL 3	11-10-14	10:35	G	Water			✓	✓		
SL 3 ms	11-10-14	10:35	G	Water			✓	✓		
SL 3 MSD	11-10-14	10:35	G	Water			✓	✓		
SL 6	11-10-14	9:35	G	Water			✓	✓		
SL 2	11-10-14	11:40	G	Water			✓	✓		
SL 10	11-10-14	12:15	G	Water			✓	✓		
SL Dup	11-10-14	10:35	G	Water			✓	✓		
				Water						
				Water						

480-71174 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11-11-14 14:00	TA		11/11/14 1400	TA
2		11/11/14 16:00	TA		11/12/14 0100	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.6 #

3855 North Ocoee Street Suite 200, Cleveland, TN 37312
(423) 336-4000 FAX (423) 336-4166

To: James Cashwell
From: Randy Morris
Date: February 18, 2015
Subject: Olin Chemical Superfund Site – December 2014 Residential Well Samples

DATA VALIDATION SUMMARY
DECEMBER 2014 RESIDENTIAL WELLS
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Data Set 240-45265-1

1.0 INTRODUCTION

Data validation was completed on sample sets containing results for residential well samples collected during the quarterly sampling event completed in December 2014. Samples included in this review are summarized in Table 1. Samples were analyzed by TestAmerica Laboratories (TAL) at locations in Westfield, Massachusetts; Savannah, Georgia; North Canton, Ohio; and West Sacramento, California, and were reported in sample delivery group (SDG) 240-45265-1. Samples were analyzed for one or more of the following parameters:

- Semivolatile Organic Compounds (SVOCs) by U.S. Environmental Protection Agency (USEPA) Method 8270D
- n-Nitrosodimethylamine (NDMA) and n-nitrosodi-n-propylamine (NDPrA) by USEPA modified Method 521 (Lab method: WS-MS-0012)
- Metals (chromium and sodium) by USEPA Method 6010
- Hexavalent chromium by USEPA Method 7196A
- Anions by USEPA Method 300.0 (chloride, sulfate) and USEPA Method 353.2 (nitrate, nitrite)
- Ammonia by USEPA 350.1

Sample results and lab data were validated in accordance with the Final Project Operations Plan Volume III-B Quality Assurance Project Plan (QAPP) [MACTEC, 2009]. For SVOCs, validation included 90%Tier II/10%Tier III validation based on USEPA Region I guidelines (USEPA, 1996). For the remaining methods an Olin Level I review was completed as described in the QAPP.

A complete summary of final sample results is included in Table 2. A summary of data qualification actions is included in Table 3. A summary of tentatively identified compounds (TICs) results for

SVOC analyses is presented in Table 4. With the exception of the items discussed below and summarized in Table 3, results are interpreted to be usable as reported by the laboratory.

2.0 SEMIVOLATILES

USEPA Region I Tier III (10%) and Tier II (90%) validation was completed for the SVOC samples based on criteria identified in Method 8270D, the QAPP, and procedures described in USEPA data validation guidelines (USEPA, 1996).

The following information was reviewed during data validation:

* Data Package Narrative, Completeness, and Chain of Custody (COC) Records
* Sample Collection, Preservation, and Holding Times
* Instrument Performance Check (tuning)
* Initial Calibration
* Continuing Calibration Results
  Quality Control (QC) Blanks
  Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
* Surrogate Recoveries
* Internal Standard Response and Retention Times
* Target Compound Identification
  Tentatively Identified Compounds (TICs)
* Calculations, Raw Data, and QC Report Verification
* Electronic Database Review
  Reporting

* = Indicates that all criteria were met for this quality control parameter.

2.1 Validation Observations and Actions

<u>QC Blanks</u>

Caprolactam (0.489 J µg/L) was detected in the method blank (MB 240-160933/4-A) associated with three project samples. A blank action level was established at five times the concentration reported in the method blank. Sample result concentrations below the action level and reported in associated samples were qualified as not detected (U) at the reporting limit. Qualified results are presented in Table 3 with a validation reason code of BL 1.

<u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u>

LCS/LCSD percent recovery results were compared to the following project QC limits: 40-140 percent for base neutral fraction compounds and 30-130 percent for acid fraction compounds, with a maximum relative percent difference (RPD) of 20 between the LCS and LCSD percent recoveries.

The LCS and/or LCSD percent recoveries were outside of control limits in prep batch 160933 for caprolactam (28/29) and benzoic acid (17/18). Benzoic acid was not detected in associated samples and the reporting limits were qualified as estimated (UJ). Caprolactam was detected in two of the three results associated with this prep batch, but the results were qualified as not detected at the reporting limit (RL) due to method blank contamination as detailed above. No additional qualification of these samples is warranted by professional judgment. The reporting limit for the sample that did not have caprolactam detected is qualified as estimated (UJ).

The LCS and/or LCSD percent recoveries were outside of control limits in prep batch 161139 for caprolactam (26/24), benzoic acid (17/20), and 2,4-dinitrophenol (27). The relative percent difference between the LCS and LCSD percent recoveries for 2,4-dinitrophenol (22) was also outside of control limits. Benzoic acid and 2,4-dinitrophenol were not detected in associated samples and the reporting limits were qualified as estimated (UJ). Caprolactam was detected at a level between the method detection limit (MDL) and RL in both project samples within this prep batch and results were flagged as estimated concentrations (J) by the laboratory. No further data qualification is deemed necessary by professional judgment.

The LCS and LCSD percent recoveries were outside of control limits in prep batch 161956 for caprolactam (28/24) and benzoic acid (19/19). Caprolactam and benzoic acid were not detected in the associated project sample and the reporting limits were qualified as estimated (UJ).

Results qualified due to LCS/LCSD recoveries are presented in Table 3 with a validation reason code of LCS-L, and results qualified due to the RPD limit being exceeded are given a validation reason code of LCS-RPD.

TICs

Low concentration TICs (< 6 µg/L) were reported in samples. Results for TICs in the samples that were also in the associated method blank were rejected and not reported in the final data results.

Reporting

N-Nitrosodi-n-propylamine (NDPrA) was reported in both the 8270D and modified 521 methods for a subset of samples. The NDPrA results from modified 521 with lower reporting limits were reported in the final data set.

3.0 NDMA and NDPrA

N-Nitrosodimethylamine (NDMA) analysis was completed using a modified USEPA Method 521 procedure, which provides very low detection limits at an analytical reporting limit of two nanograms per liter (ng/L) for NDMA and NDPrA. NDMA samples are collected in amber-glass bottles and preserved at 4 degrees Celsius prior to analysis.

QC evaluations were based on project specific method performance objectives described in the QAPP [MACTEC, 2009], the TAL Standard Operating Procedure (SOP) WS-MS-0012 for NDMA/NDPrA analysis, and professional judgment of the project chemist. Analytical packages were reviewed using data quality evaluation checklists that were developed specifically for the Olin Chemical Superfund Site. Validation included a full review of all documentation and data associated with sample collection, shipment, and analysis. The following items are reviewed:

* Data Package Narrative, Completeness, and Chain of Custody (COC) Records
* Sample Collection, Preservation, and Holding Times
* Instrument Calibration
  QC Blanks
* LCS
* Internal Standard Recovery
* Reporting Limit Review
* Raw Data Checks and Calculations Verification
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter

QC Blanks

NDMA was detected at a level (0.938 ng/L) between the MDL of 0.37 ng/L and the RL of 2.0 ng/L in Method Blank 320-60679/1-A. Since the blank contamination was less than one-half the reporting limit, no corrective action was required of the laboratory. In accordance with EPA guidelines, an action level of 5 times the blank contamination was calculated and compared to sample results. All NDMA results from samples affected by blank contamination were also compared to historical well results. It was decided by professional judgment that NDMA results above the RL (and that are less than the blank action level) are potentially biased high based on blank contamination, and were qualified as estimated concentrations (J). Results below the RL were qualified as not detected (U) at the project sample RL of 1.9 ng/L in the final data set as indicated below.

Lab Sample ID	Field Sample ID	Parameter	Final Result (ng/L)	Final Qualifier	Lab Result (ng/L)	Lab Qualifier
240-45265-1	OC-M03L02	NDMA	2.6	J	2.6	B
240-45265-2	OC-M03L2D	NDMA	1.9	U	1.3	JB
240-45265-4	OC-M03L07	NDMA	1.9	U	0.51	JB
240-45265-5	OC-M01L06	NDMA	2.1	J	2.1	B
240-45265-7	OC-M24L72A	NDMA	1.9	U	0.55	JB
240-45265-8	OC-M24L65	NDMA	1.9	U	0.51	JB
240-45265-9	OC-M24L64	NDMA	1.9	U	0.49	JB
240-45265-10	OC-M24L87	NDMA	1.9	U	0.43	JB

Lab Sample ID	Field Sample ID	Parameter	Final Result (ng/L)	Final Qualifier	Lab Result (ng/L)	Lab Qualifier
240-45265-12	OC-M24L66	NDMA	1.9	U	0.70	JB
240-45265-14	OC-M24L63	NDMA	1.9	U	0.39	JB
240-45331-1	OC-M15L2C	NDMA	1.9	U	0.37	JB

4.0 METALS

Samples were analyzed for total chromium and sodium. Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the metals parameters.

The following information was reviewed during data validation:

* Data Package Cover Letter and Narrative
* Sample Collection/COC and Holding Times
* QC Blanks
* LCS/LCSD
* Matrix Spike/Matrix Spike Duplicate (MS/MSD)
* Detection Limit Review
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter.

5.0 HEXAVALENT CHROMIUM

Samples were analyzed for hexavalent chromium by method USEPA Method 7196A. Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the metals parameters.

The following information was reviewed during data validation:

* Data Package Cover Letter and Narrative
* Sample Collection/COC and Holding Times
* QC Blanks
* LCS/LCSD
* MS/MSD
* Reporting Limit Review
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter.

6.0 GENERAL CHEMISTRY (AMMONIA, NITRATE, NITRITE, CHLORIDE, AND SULFATE)

Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the general chemistry parameters.

The following information was reviewed during data validation:

* Data Package Narrative, Completeness, and COC Records
  Sample Collection, Preservation, and Holding Times
* QC Blanks
* LCS
* Matrix Spike/Matrix Spike Duplicate (MS/MSD)
* Electronic Database Review
  Analytical Method
  Detection/Reporting Limits

* = Indicates that all criteria were met for this quality control parameter.

6.1 Validation Observations and Actions

Holding Times

The 48 hour hold time for the analysis of nitrate and nitrite was exceeded for two samples. One of the hold time violations was due to lab instrument problems, and the lab initially analyzing the samples via EPA Method 300.0 instead of the normal Method 353.2. As detailed in the laboratory narrative, both sets of nitrite/nitrate results were reported for this sample (OC-M14L2B). The hold time violation for this sample was 15 minutes. Based on professional judgment, the Method 353.2 results were the accepted data in order to be consistent with past sampling events and other project samples within this SDG. Results from samples exceeding the hold time were qualified by the laboratory with an H qualifier. Both nitrite results were non-detect at the reporting limit (RL) of 0.05 mg/L and qualified UH by the lab, while the nitrate results were between the method detection limit (MDL) and the RL and qualified JH. By professional judgment, the final nitrite reporting limits are qualified as estimated (UJ), and the nitrate results are qualified as estimated concentrations (J) as indicated in the table below. Results qualified due to holding time violations are presented in Table 3 with a validation reason code of HT.

Lab Sample ID	Field Sample ID	Parameter	Final Result (mg/L)	Final Qualifier	Lab Result (mg/L)	Lab Qualifier
240-45265-6	OC-M14L2B	Nitrite	0.050	UJ	0.05	UH
240-45265-6	OC-M14L2B	Nitrate	0.029	J	0.029	JH
240-45331-1	OC-M15L2C	Nitrite	0.050	UJ	0.05	UH
240-45331-1	OC-M15L2C	Nitrate	0.017	J	0.017	JH

Analytical Method

The laboratory initially performed the nitrite/nitrate analysis of sample OC-M14L2B by EPA Method 300.0, but later analyzed it 15 minutes outside of method specified holding time by Method 353.2 as described in the laboratory narrative and detailed above.

Reporting Limits

Nitrate and nitrite analyses were completed by the lab using USEPA Method 353.2. An elevated reporting limit of 0.05 mg/L was reported for nitrite.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

Randy J. Morris

Randy Morris
Environmental Specialist, Data Quality

February 18, 2015
Date

REFERENCES:

MACTEC Engineering and Consulting, Inc. (MACTEC), 2009. "Final Project Operation Plan Volume IIB Quality Assurance Project Plan"; Olin Chemical Superfund Site; 51 Eames Street; Wilmington, Massachusetts; August 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines for Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

Table 1
Sample Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG	Location	Field Sample Date	Field Sample ID	QC Code	Media	Method Class / Analysis Method / Fraction	Chloride, Sulfate, Nitrate E300 N	Ammonia E350.1 T	Nitrate/Nitrite as N E353.2 T	Metals SW6010 T	Hex Chromium SW7196A T	SVOCs SW8270D N	NDMA/NDPA TANDMA N
240-45265-1	M-01/L-06C	12/9/2014	OC-M01L06	FS	GW								2
240-45265-1	M-01/L-06D	12/15/2014	OC-M01L6D	FS	GW								2
240-45265-1	M-02/L-07E	12/10/2014	OC-M02L07	FS	GW		2	1	2	2	1	73	2
240-45265-1	M-03/L-02	12/9/2014	OC-M03L02	FS	GW								2
240-45265-1	M-03/L-02D	12/9/2014	OC-M03L2D	FS	GW								2
240-45265-1	M-03/L-02F	12/9/2014	OC-M03L2F	FS	GW								2
240-45265-1	M-03/L-07	12/9/2014	OC-M03L07	FS	GW								2
240-45265-1	M-14/L-02B	12/9/2014	OC-M14L2B	FS	GW		4	1	2	2	1		2
240-45265-1	M-15/L-02C	12/10/2014	OC-M15L2C	FS	GW		2	1	2	2	1	74*	2
240-45265-1	M-24/L-116	12/9/2014	OC-M24L116	FS	GW								2
240-45265-1	M-24/L-54	12/15/2014	OC-M24L54	FS	GW		2	1	2	2	1	74*	2
240-45265-1	M-24/L-63	12/9/2014	OC-M24L63	FS	GW		2	1	2	2	1	73	2
240-45265-1	M-24/L-64	12/9/2014	OC-M24L64	FS	GW		2	1	2	2	1	73	2
240-45265-1	M-24/L-65	12/9/2014	OC-M24L65	FS	GW		2	1	2	2			2
240-45265-1	M-24/L-66	12/9/2014	OC-M24L66	FS	GW		2	1	2	2			2
240-45265-1	M-24/L-72A	12/9/2014	OC-M24L72A	FS	GW		2	1	2	2			2
240-45265-1	M-24/L-87A	12/9/2014	OC-M24L87	FS	GW		2	1	2	2	1		2
240-45265-1	M-24/L-94	12/9/2014	OC-M24L94	FS	GW		2	1	2	2	1	73	2

Notes:
FS = Field Sample
GW = Groundwater
N/T = Normal/Total
Number listed under method indicates number of target analytes reported.
* Includes one reported TIC

Created by: KMS 2/17/15
Checked by: RTM 2/25/15

Table 2
Final Results Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group	240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location	M-01/L-06C		M-01/L-06D		M-02/L-07E		M-03/L-02		M-03/L-02D		M-03/L-02F		M-03/L-07	
		Field Sample Date	12/9/2014 9:55		12/15/2014 11:27		12/10/2014 11:57		12/9/2014 8:18		12/9/2014 8:25		12/9/2014 8:40		12/9/2014 9:05	
		Field Sample ID	OC-M01L06		OC-M01L6D		OC-M02L07		OC-M03L02		OC-M03L2D		OC-M03L2F		OC-M03L07	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	2.1	J	2.8		1.9	U	2.6	J	1.9	U	1.9	U	1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l					0.95	U								
SW8270D	N	1,2-Dichlorobenzene	ug/l					0.95	U								
SW8270D	N	1-Methylnaphthalene	ug/l					0.19	U								
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l					0.95	U								
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l					9.5	U								
SW8270D	N	2,4,5-Trichlorophenol	ug/l					4.8	U								
SW8270D	N	2,4,6-Trichlorophenol	ug/l					4.8	U								
SW8270D	N	2,4-Dichlorophenol	ug/l					1.9	U								
SW8270D	N	2,4-Dimethylphenol	ug/l					1.9	U								
SW8270D	N	2,4-Dinitrophenol	ug/l					4.8	UJ								
SW8270D	N	2,4-Dinitrotoluene	ug/l					4.8	U								
SW8270D	N	2,6-Dinitrotoluene	ug/l					4.8	U								
SW8270D	N	2-Chloronaphthalene	ug/l					0.95	U								
SW8270D	N	2-Chlorophenol	ug/l					0.95	U								
SW8270D	N	2-Methylnaphthalene	ug/l					0.19	U								
SW8270D	N	2-Methylphenol	ug/l					0.95	U								
SW8270D	N	2-Nitroaniline	ug/l					1.9	U								
SW8270D	N	2-Nitrophenol	ug/l					1.9	U								
SW8270D	N	3 & 4 Methylphenol	ug/l					1.9	U								
SW8270D	N	3,3'-Dichlorobenzidine	ug/l					4.8	U								
SW8270D	N	3-Nitroaniline	ug/l					1.9	U								
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l					4.8	U								
SW8270D	N	4-Bromophenyl phenyl ether	ug/l					1.9	U								
SW8270D	N	4-Chloro-3-methylphenol	ug/l					1.9	U								
SW8270D	N	4-Chloroaniline	ug/l					1.9	U								
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l					1.9	U								
SW8270D	N	4-Nitroaniline	ug/l					1.9	U								
SW8270D	N	4-Nitrophenol	ug/l					4.8	U								
SW8270D	N	Acenaphthene	ug/l					0.19	U								
SW8270D	N	Acenaphthylene	ug/l					0.19	U								
SW8270D	N	Acetophenone	ug/l					0.95	U								
SW8270D	N	Aniline	ug/l					4.8	U								
SW8270D	N	Anthracene	ug/l					0.19	U								
SW8270D	N	Atrazine	ug/l					0.95	U								
SW8270D	N	Azobenzene	ug/l					9.5	U								
SW8270D	N	Benzaldehyde	ug/l					0.95	U								
SW8270D	N	Benzo(a)anthracene	ug/l					0.19	U								
SW8270D	N	Benzo(a)pyrene	ug/l					0.19	U								
SW8270D	N	Benzo(b)fluoranthene	ug/l					0.19	U								
SW8270D	N	Benzo(ghi)perylene	ug/l					0.19	U								
SW8270D	N	Benzo(k)fluoranthene	ug/l					0.19	U								
SW8270D	N	Benzoic Acid	ug/l					24	UJ								
SW8270D	N	Benzyl alcohol	ug/l					4.8	U								
SW8270D	N	Biphenyl	ug/l					0.95	U								

Table 2
Final Results Summary
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Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group	240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location	M-01/L-06C		M-01/L-06D		M-02/L-07E		M-03/L-02		M-03/L-02D		M-03/L-02F		M-03/L-07	
		Field Sample Date	12/9/2014 9:55		12/15/2014 11:27		12/10/2014 11:57		12/9/2014 8:18		12/9/2014 8:25		12/9/2014 8:40		12/9/2014 9:05	
		Field Sample ID	OC-M01L06		OC-M01L6D		OC-M02L07		OC-M03L02		OC-M03L2D		OC-M03L2F		OC-M03L07	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l					0.95	U								
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l					0.95	U								
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l					4.8	U								
SW8270D	N	Butylbenzylphthalate	ug/l					1.9	U								
SW8270D	N	Caprolactam	ug/l					0.45	J								
SW8270D	N	Carbazole	ug/l					0.95	U								
SW8270D	N	Chrysene	ug/l					0.19	U								
SW8270D	N	Di-n-butylphthalate	ug/l					4.8	U								
SW8270D	N	Di-n-octylphthalate	ug/l					1.9	U								
SW8270D	N	Dibenz(a,h)anthracene	ug/l					0.19	U								
SW8270D	N	Dibenzofuran	ug/l					0.95	U								
SW8270D	N	Diethylphthalate	ug/l					1.9	U								
SW8270D	N	Dimethylphthalate	ug/l					1.9	U								
SW8270D	N	Diphenyl ether	ug/l					9.5	U								
SW8270D	N	Diphenylmethanone	ug/l					4.8	U								
SW8270D	N	Fluoranthene	ug/l					0.19	U								
SW8270D	N	Fluorene	ug/l					0.19	U								
SW8270D	N	Hexachlorobenzene	ug/l					0.19	U								
SW8270D	N	Hexachlorocyclopentadiene	ug/l					9.5	U								
SW8270D	N	Hexachloroethane	ug/l					0.95	U								
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l					0.19	U								
SW8270D	N	Isophorone	ug/l					0.95	U								
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l					0.95	U								
SW8270D	N	N-Nitrosodiphenylamine	ug/l					0.95	U								
SW8270D	N	Nitrobenzene	ug/l					0.95	U								
SW8270D	N	Pentachlorophenol	ug/l					4.8	U								
SW8270D	N	Phenanthrene	ug/l					0.19	U								
SW8270D	N	Phenol	ug/l					0.95	U								
SW8270D	N	Pyrene	ug/l					0.19	U								
SW6010	T	Chromium	ug/l					10	U								
SW6010	T	Sodium	ug/l					9000									
SW7196A	T	Chromium, Hexavalent	mg/l					0.005	U								
E300	N	Chloride	mg/l					28									
E300	N	Sulfate	mg/l					18									
E350.1	T	Ammonia	mg/l					0.089									
E353.2	T	Nitrate as N	mg/l					9.4									
E353.2	T	Nitrite as N	mg/l					1.3	U								

Notes:

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

ng/l = nanogram per liter

Table 2
Final Results Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group	240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location	M-14/L-02B		M-15/L-02C		M-24/L-116		M-24/L-54		M-24/L-63		M-24/L-64		M-24/L-65	
		Field Sample Date	12/9/2014 10:15		12/10/2014 11:29		12/9/2014 12:35		12/15/2014 15:14		12/9/2014 13:58		12/9/2014 11:21		12/9/2014 11:08	
		Field Sample ID	OC-M14L2B		OC-M15L2C		OC-M24L116		OC-M24L54		OC-M24L63		OC-M24L64		OC-M24L65	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	2.1	
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.9	U	1.9	U	1.9	U	22		1.9	U	1.9	U	1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	1,2-Dichlorobenzene	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	1-Methylnaphthalene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l			9.9	U			9.5	U	9.5	U	9.7	U		
SW8270D	N	2,4,5-Trichlorophenol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	2,4,6-Trichlorophenol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	2,4-Dichlorophenol	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	2,4-Dimethylphenol	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	2,4-Dinitrophenol	ug/l			5	UJ			4.8	U	4.8	U	4.9	U		
SW8270D	N	2,4-Dinitrotoluene	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	2,6-Dinitrotoluene	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	2-Chloronaphthalene	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	2-Chlorophenol	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	2-Methylnaphthalene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	2-Methylphenol	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	2-Nitroaniline	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	2-Nitrophenol	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	3 & 4 Methylphenol	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	3,3'-Dichlorobenzidine	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	3-Nitroaniline	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	4-Bromophenyl phenyl ether	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4-Chloro-3-methylphenol	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4-Chloroaniline	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4-Nitroaniline	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	4-Nitrophenol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Acenaphthene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Acenaphthylene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Acetophenone	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Aniline	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Anthracene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Atrazine	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Azobenzene	ug/l			9.9	U			9.5	U	9.5	U	9.7	U		
SW8270D	N	Benzaldehyde	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Benzo(a)anthracene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Benzo(a)pyrene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Benzo(b)fluoranthene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Benzo(ghi)perylene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Benzo(k)fluoranthene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Benzoic Acid	ug/l			25	UJ			24	UJ	24	UJ	24	UJ		
SW8270D	N	Benzyl alcohol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Biphenyl	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		

Table 2
Final Results Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group	240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location	M-14/L-02B		M-15/L-02C		M-24/L-116		M-24/L-54		M-24/L-63		M-24/L-64		M-24/L-65	
		Field Sample Date	12/9/2014 10:15		12/10/2014 11:29		12/9/2014 12:35		12/15/2014 15:14		12/9/2014 13:58		12/9/2014 11:21		12/9/2014 11:08	
		Field Sample ID	OC-M14L2B		OC-M15L2C		OC-M24L116		OC-M24L54		OC-M24L63		OC-M24L64		OC-M24L65	
		Qc Code	FS		FS		FS		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Butylbenzylphthalate	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	Caprolactam	ug/l			0.34	J			4.8	UJ	4.8	U	4.9	UJ		
SW8270D	N	Carbazole	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Chrysene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Di-n-butylphthalate	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Di-n-octylphthalate	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	Dibenz(a,h)anthracene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Dibenzofuran	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Diethylphthalate	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	Dimethylphthalate	ug/l			2	U			1.9	U	1.9	U	1.9	U		
SW8270D	N	Diphenyl ether	ug/l			9.9	U			9.5	U	9.5	U	9.7	U		
SW8270D	N	Diphenylmethanone	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Fluoranthene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Fluorene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Hexachlorobenzene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Hexachlorocyclopentadiene	ug/l			9.9	U			9.5	U	9.5	U	9.7	U		
SW8270D	N	Hexachloroethane	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Isophorone	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	N-Nitrosodiphenylamine	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Nitrobenzene	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Pentachlorophenol	ug/l			5	U			4.8	U	4.8	U	4.9	U		
SW8270D	N	Phenanthrene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW8270D	N	Phenol	ug/l			0.99	U			0.95	U	0.95	U	0.97	U		
SW8270D	N	Pyrene	ug/l			0.2	U			0.19	U	0.19	U	0.19	U		
SW6010	T	Chromium	ug/l	10	U	10	U			10	U	0.76	J	1.1	J	0.99	J
SW6010	T	Sodium	ug/l	25000		22000				23000		22000		21000		19000	
SW7196A	T	Chromium, Hexavalent	mg/l	0.005	U	0.005	U			0.005	U	0.005	U	0.005	U		
E300	N	Chloride	mg/l	15		110				79		130		130		85	
E300	N	Sulfate	mg/l	52		30				28		19		19		24	
E350.1	T	Ammonia	mg/l	0.11		0.12				0.11		0.14		0.14		0.083	
E353.2	T	Nitrate as N	mg/l	0.029	J	0.017	J			0.05	U	0.57		0.65		0.34	
E353.2	T	Nitrite as N	mg/l	0.05	UJ	0.05	UJ			0.05	U	0.05	U	0.05	U	0.05	U

Notes:

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

ng/l = nanogram per liter

Table 2
Final Results Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location		M-24/L-66		M-24/L-72A		M-24/L-87A		M-24/L-94	
		Field Sample Date		12/9/2014 13:06		12/9/2014 10:53		12/9/2014 12:20		12/9/2014 13:22	
		Field Sample ID		OC-M24L66		OC-M24L72A		OC-M24L87		OC-M24L94	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	2.4		1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.9	U	1.9	U	1.9	U	5.1	
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l							0.95	U
SW8270D	N	1,2-Dichlorobenzene	ug/l							0.95	U
SW8270D	N	1-Methylnaphthalene	ug/l							0.19	U
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l							0.95	U
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l							9.5	U
SW8270D	N	2,4,5-Trichlorophenol	ug/l							4.8	U
SW8270D	N	2,4,6-Trichlorophenol	ug/l							4.8	U
SW8270D	N	2,4-Dichlorophenol	ug/l							1.9	U
SW8270D	N	2,4-Dimethylphenol	ug/l							1.9	U
SW8270D	N	2,4-Dinitrophenol	ug/l							4.8	U
SW8270D	N	2,4-Dinitrotoluene	ug/l							4.8	U
SW8270D	N	2,6-Dinitrotoluene	ug/l							4.8	U
SW8270D	N	2-Chloronaphthalene	ug/l							0.95	U
SW8270D	N	2-Chlorophenol	ug/l							0.95	U
SW8270D	N	2-Methylnaphthalene	ug/l							0.19	U
SW8270D	N	2-Methylphenol	ug/l							0.95	U
SW8270D	N	2-Nitroaniline	ug/l							1.9	U
SW8270D	N	2-Nitrophenol	ug/l							1.9	U
SW8270D	N	3 & 4 Methylphenol	ug/l							1.9	U
SW8270D	N	3,3'-Dichlorobenzidine	ug/l							4.8	U
SW8270D	N	3-Nitroaniline	ug/l							1.9	U
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l							4.8	U
SW8270D	N	4-Bromophenyl phenyl ether	ug/l							1.9	U
SW8270D	N	4-Chloro-3-methylphenol	ug/l							1.9	U
SW8270D	N	4-Chloroaniline	ug/l							1.9	U
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l							1.9	U
SW8270D	N	4-Nitroaniline	ug/l							1.9	U
SW8270D	N	4-Nitrophenol	ug/l							4.8	U
SW8270D	N	Acenaphthene	ug/l							0.19	U
SW8270D	N	Acenaphthylene	ug/l							0.19	U
SW8270D	N	Acetophenone	ug/l							0.95	U
SW8270D	N	Aniline	ug/l							4.8	U
SW8270D	N	Anthracene	ug/l							0.19	U
SW8270D	N	Atrazine	ug/l							0.95	U
SW8270D	N	Azobenzene	ug/l							9.5	U
SW8270D	N	Benzaldehyde	ug/l							0.95	U
SW8270D	N	Benzo(a)anthracene	ug/l							0.19	U
SW8270D	N	Benzo(a)pyrene	ug/l							0.19	U
SW8270D	N	Benzo(b)fluoranthene	ug/l							0.19	U
SW8270D	N	Benzo(ghi)perylene	ug/l							0.19	U
SW8270D	N	Benzo(k)fluoranthene	ug/l							0.19	U
SW8270D	N	Benzoic Acid	ug/l							24	UJ
SW8270D	N	Benzyl alcohol	ug/l							4.8	U
SW8270D	N	Biphenyl	ug/l							0.95	U

Table 2
Final Results Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-45265-1		240-45265-1		240-45265-1		240-45265-1	
		Location		M-24/L-66		M-24/L-72A		M-24/L-87A		M-24/L-94	
		Field Sample Date		12/9/2014 13:06		12/9/2014 10:53		12/9/2014 12:20		12/9/2014 13:22	
		Field Sample ID		OC-M24L66		OC-M24L72A		OC-M24L87		OC-M24L94	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l							0.95	U
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l							0.95	U
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l							4.8	U
SW8270D	N	Butylbenzylphthalate	ug/l							1.9	U
SW8270D	N	Caprolactam	ug/l							4.8	U
SW8270D	N	Carbazole	ug/l							0.95	U
SW8270D	N	Chrysene	ug/l							0.19	U
SW8270D	N	Di-n-butylphthalate	ug/l							4.8	U
SW8270D	N	Di-n-octylphthalate	ug/l							1.9	U
SW8270D	N	Dibenz(a,h)anthracene	ug/l							0.19	U
SW8270D	N	Dibenzofuran	ug/l							0.95	U
SW8270D	N	Diethylphthalate	ug/l							1.9	U
SW8270D	N	Dimethylphthalate	ug/l							1.9	U
SW8270D	N	Diphenyl ether	ug/l							9.5	U
SW8270D	N	Diphenylmethanone	ug/l							4.8	U
SW8270D	N	Fluoranthene	ug/l							0.19	U
SW8270D	N	Fluorene	ug/l							0.19	U
SW8270D	N	Hexachlorobenzene	ug/l							0.19	U
SW8270D	N	Hexachlorocyclopentadiene	ug/l							9.5	U
SW8270D	N	Hexachloroethane	ug/l							0.95	U
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l							0.19	U
SW8270D	N	Isophorone	ug/l							0.95	U
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l							0.95	U
SW8270D	N	N-Nitrosodiphenylamine	ug/l							0.95	U
SW8270D	N	Nitrobenzene	ug/l							0.95	U
SW8270D	N	Pentachlorophenol	ug/l							4.8	U
SW8270D	N	Phenanthrene	ug/l							0.19	U
SW8270D	N	Phenol	ug/l							0.95	U
SW8270D	N	Pyrene	ug/l							0.19	U
SW6010	T	Chromium	ug/l	10	U	10	U	0.55	J	0.62	J
SW6010	T	Sodium	ug/l	3000	J	8600		27000		120000	
SW7196A	T	Chromium, Hexavalent	mg/l					0.005	U	0.005	U
E300	N	Chloride	mg/l	4.2		35		160		280	
E300	N	Sulfate	mg/l	8.2		26		17		18	
E350.1	T	Ammonia	mg/l	0.1		0.11		0.13		0.13	
E353.2	T	Nitrate as N	mg/l	0.05	U	1.3		0.3		2	
E353.2	T	Nitrite as N	mg/l	0.05	U	0.25	U	0.05	U	0.25	U

Notes:

FS = field sample

U = not detected, value is the reporting limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

ng/l = nanogram per liter

Prepared by / Date: KMS 2/19/15

Checked by / Date: RTM 2/19/15

Table 3
Data Validation Action Summary
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab Sample Delivery Group	Lab Sample ID	Method	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Validation Reason Code	Result Units
240-45265-1	240-45265-5	TANDMA	OC-M01L06	N-Nitrosodimethylamine	2.1	B	2.1	J	BL1	ng/l
240-45265-1	240-45265-13	SW8270D	OC-M24L94	Caprolactam	0.35	J B	4.8	U	BL1	ug/l
240-45265-1	240-45265-14	TANDMA	OC-M24L63	N-Nitrosodimethylamine	0.39	J B	1.9	U	BL1	ng/l
240-45265-1	240-45331-1	TANDMA	OC-M15L2C	N-Nitrosodimethylamine	0.37	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-10	TANDMA	OC-M24L87	N-Nitrosodimethylamine	0.43	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-7	TANDMA	OC-M24L72A	N-Nitrosodimethylamine	0.55	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-12	TANDMA	OC-M24L66	N-Nitrosodimethylamine	0.7	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-8	TANDMA	OC-M24L65	N-Nitrosodimethylamine	0.51	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-9	TANDMA	OC-M24L64	N-Nitrosodimethylamine	0.49	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-2	TANDMA	OC-M03L2D	N-Nitrosodimethylamine	1.3	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-4	TANDMA	OC-M03L07	N-Nitrosodimethylamine	0.51	J B	1.9	U	BL1	ng/l
240-45265-1	240-45265-1	TANDMA	OC-M03L02	N-Nitrosodimethylamine	2.6	B	2.6	J	BL1	ng/l
240-45265-1	240-45265-14	SW8270D	OC-M24L63	Caprolactam	0.32	J B	4.8	U	BL1	ug/l
240-45265-1	240-45265-6	E353.2	OC-M14L2B	Nitrite as N	0.05	U H	0.05	UJ	HT	mg/l
240-45265-1	240-45331-1	E353.2	OC-M15L2C	Nitrite as N	0.05	U H	0.05	UJ	HT	mg/l
240-45265-1	240-45265-6	E353.2	OC-M14L2B	Nitrate as N	0.029	J H	0.029	J	HT	mg/l
240-45265-1	240-45331-1	E353.2	OC-M15L2C	Nitrate as N	0.017	J H	0.017	J	HT	mg/l
240-45265-1	240-45524-2	SW8270D	OC-M24L54	Caprolactam	4.8	U	4.8	UJ	LCS-L	ug/l
240-45265-1	240-45265-13	SW8270D	OC-M24L94	Benzoic Acid	24	U	24	UJ	LCS-L	ug/l
240-45265-1	240-45265-9	SW8270D	OC-M24L64	Benzoic Acid	24	U	24	UJ	LCS-L	ug/l
240-45265-1	240-45265-14	SW8270D	OC-M24L63	Benzoic Acid	24	U	24	UJ	LCS-L	ug/l
240-45265-1	240-45331-1	SW8270D	OC-M15L2C	Benzoic Acid	25	U	25	UJ	LCS-L	ug/l
240-45265-1	240-45331-2	SW8270D	OC-M02L07	Benzoic Acid	24	U	24	UJ	LCS-L	ug/l
240-45265-1	240-45265-9	SW8270D	OC-M24L64	Caprolactam	4.9	U	4.9	UJ	LCS-L	ug/l
240-45265-1	240-45524-2	SW8270D	OC-M24L54	Benzoic Acid	24	U	24	UJ	LCS-L	ug/l
240-45265-1	240-45331-2	SW8270D	OC-M02L07	2,4-Dinitrophenol	4.8	U	4.8	UJ	LCS-L, LCS-RPD	ug/l
240-45265-1	240-45331-1	SW8270D	OC-M15L2C	2,4-Dinitrophenol	5	U	5	UJ	LCS-L, LCS-RPD	ug/l

Units:

ng/l = nanogram per liter
ug/l = microgram per liter
mg/l = milligram per liter

Validation Reason Codes:

BL1 = Method Blank Qualifier
HT = Holding time for prep or analysis exceedance
LCS-L = LCS recovery low
LCS-RPD = LCS-LCSD relative percent difference limit exceedance

Validation Qualifier:

U = not detected, value is the reporting limit
J = value is estimated

Prepared by / Date: KMS 2/19/15

Checked by / Date: RTM 2/25/15

Table 4
Final Results Summary - Tentatively Identified Compounds
Data Validation Report
December 2014 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG	Lab Sample ID	Analytical Method	Sample ID	Date Sampled	Date Analyzed	Time Analyzed	CAS No	Chemical Name	TIC Retention Time	Result Value	Lab Qualifier	Final Result	Final Qualifier	Result Unit	Dilution Factor	Refuse Flag
240-45265-1	240-45331-1	SW8270D	OC-M15L2C	12/10/2014	12/18/2014	4:38 PM	HLA0058	TIC(s) Unspecified	6.55	1.6	T J	1.6	JN	ug/l	1	N
240-45265-1	240-45524-2	SW8270D	OC-M24L54	12/15/2014	12/20/2014	11:52 AM	HLA0058	TIC(s) Unspecified	6.57	2.2	T J	2.2	JN	ug/l	1	N

Notes:
T = Tentatively identified compound, the result is estimated
J = value is estimated
N = Presumptively present
ug/l = microgram per liter

Prepared by / Date: KMS 2/19/15
Checked by / Date: RTM 2/25/15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-45265-1
Client Project/Site: Olin Wilmington Residential Well

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/12/2015 2:49:00 PM
Rich Emerich, Analyst V
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Designee for

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Job ID: 240-45265-1

Laboratory: TestAmerica Canton

Narrative

Receipt
The samples were received on 12/10/2014 at 9:40 AM, 12/11/2014 at 9:45 AM and 12/16/2014 at 10:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.9º C, 1.5º C and 3.6º C.

GC/MS Semi VOA
Method 8270D: The continuing calibration verification (CCV) associated with batch 161554 recovered above the upper control limit for Pentachlorophenol. The samples associated with this CCV were non-detects for the affected analytes, therefore, the data have been reported. The following samples were impacted: (240-45265-9), (240-45265-13), (240-45265-14), (240-45331-1) and (240-45331-2).

Method 8270D: The CCV for batch 161956 recovered low for the following analytes: Benzaldehyde and Hexachlorocyclopentadiene. An LODV was analyzed at the RL to support the ND's for these compounds.

Method GCMSMS_NDMA: The method blank for prep batch 60679 (analytical batch 61465) contained NDMA above the method detection limit. This target analyte concentration was less than 1/2 the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method 7196A: Method 7196A: The EPA 7196A source method specifies a recovery range of 85-115% for matrix spike (MS) and matrix spike duplicate (MSD), but MCP specifies a broader recovery range of 75-125% for MS/MSD. Therefore the MS/MSD and the associated sample data has been flagged only if the MS/MSD exceeded the MCP recovery range.

Method 353.2: The following sample was received with insufficient holding time remaining to perform the analysis within the method proscribed holding time: OC-M15L2C (240-45331-1).

Method 300.0: The native sample, matrix spike, and matrix spike duplicate (MS/MSD) associated with batch 680-363655 were performed at the same dilution. Due to the additional level of analyte present in the spiked samples, the concentration of sulfate in the MS/MSD was above the instrument calibration range. The data have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 60679 for method NDMA-aqueous.

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 61026 for method NDMA-aqueous.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Canton** Project #: **240-45265-1**

Project Location: **Olin Wilmington Residential Well** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

240-45265-1 [6-10 & 12-14], 240-45331-1 [1-2], 240-45524-1 [2]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ■	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ■	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ■ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	☐ Yes ■ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 1/12/15 14:41

This form has been electronically signed and approved.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **240-45265-1**

Project Location: **Olin Wilmington Residential Well** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

240-45265-1 [6, 9, 10, 13 & 14], 240-45531-1 [1-2], 240-45524-1 [2]

Matrices: ■ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	Mass DEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ■	Mass DEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	Mass DEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	■ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	■ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	■ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	■ Yes ☐ No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	■ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	■ Yes ☐ No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	■ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	■ Yes ☐ No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Technical Director, TestAmerica Westfield

Printed Name: Richard Emerich Date: 1/12/15 14:30

This form has been electronically signed and approved.

Method Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
GCMSMS_NDMA	Nitrosamines by Isotope Dilution and GC/CI/MS/MS	TestAmerica SOP	TAL SAC
300.0	Anions, Ion Chromatography	MCAWW	TAL SAV
6010	Metals (ICP)	SW846	TAL CAN
350.1	Nitrogen, Ammonia	MCAWW	TAL SAV
353.2	Nitrogen, Nitrite	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
7196A	Chromium, Hexavalent	SW846	TAL WFD

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-45265-1	OC-M03L02	Water	12/09/14 08:18	12/10/14 09:40
240-45265-2	OC-M03L2D	Water	12/09/14 08:25	12/10/14 09:40
240-45265-3	OC-M03L2F	Water	12/09/14 08:40	12/10/14 09:40
240-45265-4	OC-M03L07	Water	12/09/14 09:05	12/10/14 09:40
240-45265-5	OC-M01L06	Water	12/09/14 09:55	12/10/14 09:40
240-45265-6	OC-M14L2B	Water	12/09/14 10:15	12/10/14 09:40
240-45265-7	OC-M24L72A	Water	12/09/14 10:53	12/10/14 09:40
240-45265-8	OC-M24L65	Water	12/09/14 11:08	12/10/14 09:40
240-45265-9	OC-M24L64	Water	12/09/14 11:21	12/10/14 09:40
240-45265-10	OC-M24L87	Water	12/09/14 12:20	12/10/14 09:40
240-45265-11	OC-M24L116	Water	12/09/14 12:35	12/10/14 09:40
240-45265-12	OC-M24L66	Water	12/09/14 13:06	12/10/14 09:40
240-45265-13	OC-M24L94	Water	12/09/14 13:22	12/10/14 09:40
240-45265-14	OC-M24L63	Water	12/09/14 13:58	12/10/14 09:40
240-45331-1	OC-M15L2C	Water	12/10/14 11:29	12/11/14 09:45
240-45331-2	OC-M02L07	Water	12/10/14 11:57	12/11/14 09:45
240-45524-1	OC-M01L6D	Water	12/15/14 11:27	12/16/14 10:05
240-45524-2	OC-M24L54	Water	12/15/14 15:14	12/16/14 10:05

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L02 — Lab Sample ID: 240-45265-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	2.6	B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M03L2D — Lab Sample ID: 240-45265-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	1.3	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M03L2F — Lab Sample ID: 240-45265-3

No Detections.

Client Sample ID: OC-M03L07 — Lab Sample ID: 240-45265-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.51	J B	1.9	0.38	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M01L06 — Lab Sample ID: 240-45265-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	2.1	B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M14L2B — Lab Sample ID: 240-45265-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	52		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	25000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.11		0.050	0.026	mg/L	1		350.1	Total/NA

Client Sample ID: OC-M24L72A — Lab Sample ID: 240-45265-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodi-n-propylamine	2.4		1.9	0.45	ng/L	1		GCMSMS_NDMA	Total/NA
N-Nitrosodimethylamine	0.55	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	35		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	26		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	8600	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.11		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	1.3		0.25	0.050	mg/L	5		353.2	Total/NA

Client Sample ID: OC-M24L65 — Lab Sample ID: 240-45265-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodi-n-propylamine	2.1		1.9	0.44	ng/L	1		GCMSMS_NDMA	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L65 (Continued) — Lab Sample ID: 240-45265-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.51	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	85		1.0	0.40	mg/L	2		300.0	Total/NA
Sulfate	24		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.99	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	19000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.083		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	0.34		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L64 — Lab Sample ID: 240-45265-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.49	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	130		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	19		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	1.1	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	21000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.14		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	0.65		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L87 — Lab Sample ID: 240-45265-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.43	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	160		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	17		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.55	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	27000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.13		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	0.30		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L116 — Lab Sample ID: 240-45265-11

No Detections.

Client Sample ID: OC-M24L66 — Lab Sample ID: 240-45265-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.70	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	4.2		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	8.2		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	3000	J B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.10		0.050	0.026	mg/L	1		350.1	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L94 — Lab Sample ID: 240-45265-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.35	J B	4.8	0.19	ug/L	1		8270D	Total/NA
N-Nitrosodimethylamine	5.1	B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	280		5.0	2.0	mg/L	10		300.0	Total/NA
Sulfate	18		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.62	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	120000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.13		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	2.0		0.25	0.050	mg/L	5		353.2	Total/NA

Client Sample ID: OC-M24L63 — Lab Sample ID: 240-45265-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.32	J B	4.8	0.19	ug/L	1		8270D	Total/NA
N-Nitrosodimethylamine	0.39	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	130		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	19		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.76	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	22000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.14		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	0.57		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M15L2C — Lab Sample ID: 240-45331-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.34	J	5.0	0.20	ug/L	1		8270D	Total/NA
N-Nitrosodimethylamine	0.37	J B	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	110		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	30		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	22000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.12		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	0.017	J H	0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M02L07 — Lab Sample ID: 240-45331-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.45	J	4.8	0.19	ug/L	1		8270D	Total/NA
Chloride	28		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	18		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	9000	B	5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.089		0.050	0.026	mg/L	1		350.1	Total/NA
Nitrate as N	9.4		1.3	0.25	mg/L	25		353.2	Total/NA

Client Sample ID: OC-M01L6D — Lab Sample ID: 240-45524-1

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-M01L6D (Continued)

Lab Sample ID: 240-45524-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	2.8		1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M24L54

Lab Sample ID: 240-45524-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	22		1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	79		1.0	0.40	mg/L	2		300.0	Total/NA
Sulfate	28		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	23000		5000	180	ug/L	1		6010	Total Recoverable
Ammonia	0.11		0.050	0.026	mg/L	1		350.1	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L02
Date Collected: 12/09/14 08:18
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 19:33	1
N-Nitrosodimethylamine	**2.6**	**B**	1.9	0.37	ng/L		12/15/14 10:45	12/23/14 19:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*12/15/14 10:45*	*12/23/14 19:33*	*1*
N-Nitrosodi-n-propylamine-d14	*80*		*25 - 150*	*12/15/14 10:45*	*12/23/14 19:33*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L2D
Date Collected: 12/09/14 08:25
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-2
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 20:11	1
N-Nitrosodimethylamine	**1.3**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/23/14 20:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*41*		*25 - 150*	*12/15/14 10:45*	*12/23/14 20:11*	*1*
N-Nitrosodi-n-propylamine-d14	*72*		*25 - 150*	*12/15/14 10:45*	*12/23/14 20:11*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L2F
Date Collected: 12/09/14 08:40
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-3
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 20:49	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		12/15/14 10:45	12/23/14 20:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*12/15/14 10:45*	*12/23/14 20:49*	*1*
N-Nitrosodi-n-propylamine-d14	*70*		*25 - 150*	*12/15/14 10:45*	*12/23/14 20:49*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L07
Date Collected: 12/09/14 09:05
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-4
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 21:27	1
N-Nitrosodimethylamine	**0.51**	**J B**	1.9	0.38	ng/L		12/15/14 10:45	12/23/14 21:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*12/15/14 10:45*	*12/23/14 21:27*	*1*
N-Nitrosodi-n-propylamine-d14	*64*		*25 - 150*	*12/15/14 10:45*	*12/23/14 21:27*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M01L06
Date Collected: 12/09/14 09:55
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-5
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 22:05	1
N-Nitrosodimethylamine	**2.1**	**B**	1.9	0.37	ng/L		12/15/14 10:45	12/23/14 22:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*12/15/14 10:45*	*12/23/14 22:05*	*1*
N-Nitrosodi-n-propylamine-d14	*68*		*25 - 150*	*12/15/14 10:45*	*12/23/14 22:05*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M14L2B
Date Collected: 12/09/14 10:15
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-6
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 22:44	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		12/15/14 10:45	12/23/14 22:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*12/15/14 10:45*	*12/23/14 22:44*	*1*
N-Nitrosodi-n-propylamine-d14	*69*		*25 - 150*	*12/15/14 10:45*	*12/23/14 22:44*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**15**		0.50	0.20	mg/L			12/17/14 12:34	1
Nitrate as N	ND		0.050	0.023	mg/L			12/11/14 09:34	1
Sulfate	**52**		1.0	0.40	mg/L			12/17/14 12:34	1
Nitrite as N	ND		0.050	0.023	mg/L			12/11/14 09:34	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 10:01	1
Sodium	**25000**	**B**	5000	180	ug/L		12/12/14 09:47	12/15/14 10:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.11**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 14:53	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L72A
Date Collected: 12/09/14 10:53
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-7
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	2.4		1.9	0.45	ng/L		12/15/14 10:45	12/23/14 23:22	1
N-Nitrosodimethylamine	0.55	J B	1.9	0.37	ng/L		12/15/14 10:45	12/23/14 23:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*12/15/14 10:45*	*12/23/14 23:22*	*1*
N-Nitrosodi-n-propylamine-d14	*73*		*25 - 150*	*12/15/14 10:45*	*12/23/14 23:22*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	35		0.50	0.20	mg/L			12/17/14 13:20	1
Sulfate	26		1.0	0.40	mg/L			12/17/14 13:20	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 10:21	1
Sodium	8600	B	5000	180	ug/L		12/12/14 09:47	12/15/14 10:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.11		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 14:53	1
Nitrate as N	1.3		0.25	0.050	mg/L			12/11/14 10:26	5
Nitrite as N	ND		0.25	0.050	mg/L			12/11/14 10:26	5

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L65
Date Collected: 12/09/14 11:08
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-8
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	2.1		1.9	0.44	ng/L		12/15/14 10:45	12/24/14 00:00	1
N-Nitrosodimethylamine	0.51	J B	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 00:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*12/15/14 10:45*	*12/24/14 00:00*	*1*
N-Nitrosodi-n-propylamine-d14	*68*		*25 - 150*	*12/15/14 10:45*	*12/24/14 00:00*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	85		1.0	0.40	mg/L			12/17/14 16:56	2
Sulfate	24		1.0	0.40	mg/L			12/17/14 13:36	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.99	J	10	0.55	ug/L		12/12/14 09:47	12/15/14 10:25	1
Sodium	19000	B	5000	180	ug/L		12/12/14 09:47	12/15/14 10:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.083		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	0.34		0.050	0.010	mg/L			12/11/14 10:31	1
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:31	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L64
Date Collected: 12/09/14 11:21
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Nitrophenol	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzaldehyde	ND		0.97	0.38	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		12/15/14 06:57	12/18/14 15:31	1
Fluorene	ND		0.19	0.039	ug/L		12/15/14 06:57	12/18/14 15:31	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		12/15/14 06:57	12/18/14 15:31	1
Carbazole	ND		0.97	0.27	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzyl alcohol	ND		4.9	0.37	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzo[a]pyrene	ND		0.19	0.050	ug/L		12/15/14 06:57	12/18/14 15:31	1
3 & 4 Methylphenol	ND		1.9	0.78	ug/L		12/15/14 06:57	12/18/14 15:31	1
4-Nitroaniline	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 15:31	1
Aniline	ND		4.9	0.33	ug/L		12/15/14 06:57	12/18/14 15:31	1
Bis(2-chloroethoxy)methane	ND		0.97	0.31	ug/L		12/15/14 06:57	12/18/14 15:31	1
N-Nitrosodiphenylamine	ND		0.97	0.30	ug/L		12/15/14 06:57	12/18/14 15:31	1
Acenaphthylene	ND		0.19	0.047	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Chlorophenol	ND		0.97	0.28	ug/L		12/15/14 06:57	12/18/14 15:31	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Nitroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:31	1
Pentachlorophenol	ND		4.9	0.26	ug/L		12/15/14 06:57	12/18/14 15:31	1
Dibenzofuran	ND		0.97	0.019	ug/L		12/15/14 06:57	12/18/14 15:31	1
Hexachlorocyclopentadiene	ND		9.7	0.23	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzo[a]anthracene	ND		0.19	0.029	ug/L		12/15/14 06:57	12/18/14 15:31	1
Chrysene	ND		0.19	0.049	ug/L		12/15/14 06:57	12/18/14 15:31	1
4,6-Dinitro-2-methylphenol	ND		4.9	2.3	ug/L		12/15/14 06:57	12/18/14 15:31	1
1,2,4,5-Tetrachlorobenzene	ND		0.97	0.53	ug/L		12/15/14 06:57	12/18/14 15:31	1
4-Chloroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4-Dinitrotoluene	ND		4.9	0.24	ug/L		12/15/14 06:57	12/18/14 15:31	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 15:31	1
Azobenzene	ND		9.7	0.28	ug/L		12/15/14 06:57	12/18/14 15:31	1
Atrazine	ND		0.97	0.33	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzo[g,h,i]perylene	ND		0.19	0.045	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		12/15/14 06:57	12/18/14 15:31	1
Phenanthrene	ND		0.19	0.060	ug/L		12/15/14 06:57	12/18/14 15:31	1
Caprolactam	ND		4.9	0.19	ug/L		12/15/14 06:57	12/18/14 15:31	1
3-Nitroaniline	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 15:31	1
Fluoranthene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 15:31	1
1,1'-Biphenyl	ND		0.97	0.13	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Methylphenol	ND		0.97	0.17	ug/L		12/15/14 06:57	12/18/14 15:31	1
N-Nitrosodi-n-propylamine	ND		0.97	0.23	ug/L		12/15/14 06:57	12/18/14 15:31	1
Pyrene	ND		0.19	0.041	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzoic acid	ND		24	9.7	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Methylnaphthalene	ND		0.19	0.088	ug/L		12/15/14 06:57	12/18/14 15:31	1
Hexachlorobenzene	ND		0.19	0.083	ug/L		12/15/14 06:57	12/18/14 15:31	1
Acenaphthene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,2'-oxybis[1-chloropropane]	ND		0.97	0.39	ug/L		12/15/14 06:57	12/18/14 15:31	1
Phenyl ether	ND		9.7	1.2	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,3,4,6-Tetrachlorophenol	ND		9.7	0.56	ug/L		12/15/14 06:57	12/18/14 15:31	1

Client Sample ID: OC-M24L64
Date Collected: 12/09/14 11:21
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:31	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		12/15/14 06:57	12/18/14 15:31	1
Bis(2-ethylhexyl) phthalate	ND		4.9	1.7	ug/L		12/15/14 06:57	12/18/14 15:31	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		12/15/14 06:57	12/18/14 15:31	1
Di-n-butyl phthalate	ND		4.9	1.7	ug/L		12/15/14 06:57	12/18/14 15:31	1
Isophorone	ND		0.97	0.26	ug/L		12/15/14 06:57	12/18/14 15:31	1
Phenol	ND		0.97	0.58	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,6-Dinitrotoluene	ND		4.9	0.78	ug/L		12/15/14 06:57	12/18/14 15:31	1
Diethyl phthalate	ND		1.9	0.58	ug/L		12/15/14 06:57	12/18/14 15:31	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4,6-Trichlorophenol	ND		4.9	0.23	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4,5-Trichlorophenol	ND		4.9	0.29	ug/L		12/15/14 06:57	12/18/14 15:31	1
Nitrobenzene	ND		0.97	0.039	ug/L		12/15/14 06:57	12/18/14 15:31	1
Anthracene	ND		0.19	0.085	ug/L		12/15/14 06:57	12/18/14 15:31	1
Bis(2-chloroethyl)ether	ND		0.97	0.097	ug/L		12/15/14 06:57	12/18/14 15:31	1
2-Chloronaphthalene	ND		0.97	0.097	ug/L		12/15/14 06:57	12/18/14 15:31	1
2,4-Dinitrophenol	ND		4.9	0.31	ug/L		12/15/14 06:57	12/18/14 15:31	1
4-Nitrophenol	ND		4.9	0.28	ug/L		12/15/14 06:57	12/18/14 15:31	1
Acetophenone	ND		0.97	0.33	ug/L		12/15/14 06:57	12/18/14 15:31	1
1,2-Dichlorobenzene	ND		0.97	0.28	ug/L		12/15/14 06:57	12/18/14 15:31	1
3,3'-Dichlorobenzidine	ND		4.9	0.36	ug/L		12/15/14 06:57	12/18/14 15:31	1
Hexachloroethane	ND		0.97	0.18	ug/L		12/15/14 06:57	12/18/14 15:31	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		12/15/14 06:57	12/18/14 15:31	1
Benzophenone	ND		4.9	4.9	ug/L		12/15/14 06:57	12/18/14 15:31	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethanol, 2-[2-(2-butoxyethoxy)ethoxy]	*4.2*	*T J N*	*ug/L*		*8.30*	*143-22-6*	*12/15/14 06:57*	*12/18/14 15:31*	*1*

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Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*78*		*31 - 115*	*12/15/14 06:57*	*12/18/14 15:31*	*1*
2-Fluorobiphenyl (Surr)	*64*		*29 - 110*	*12/15/14 06:57*	*12/18/14 15:31*	*1*
2,4,6-Tribromophenol	*57*		*21 - 128*	*12/15/14 06:57*	*12/18/14 15:31*	*1*
Nitrobenzene-d5	*63*		*31 - 110*	*12/15/14 06:57*	*12/18/14 15:31*	*1*
Phenol-d5	*16*		*10 - 110*	*12/15/14 06:57*	*12/18/14 15:31*	*1*
2-Fluorophenol	*28*		*15 - 110*	*12/15/14 06:57*	*12/18/14 15:31*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 00:38	1
N-Nitrosodimethylamine	**0.49**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 00:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*12/15/14 10:45*	*12/24/14 00:38*	*1*
N-Nitrosodi-n-propylamine-d14	*66*		*25 - 150*	*12/15/14 10:45*	*12/24/14 00:38*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		2.0	0.80	mg/L			12/17/14 17:12	4
Sulfate	**19**		1.0	0.40	mg/L			12/17/14 13:51	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L64
Date Collected: 12/09/14 11:21
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-9
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.1	J	10	0.55	ug/L		12/12/14 09:47	12/15/14 10:29	1
Sodium	21000	B	5000	180	ug/L		12/12/14 09:47	12/15/14 10:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.14		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	0.65		0.050	0.010	mg/L			12/11/14 10:32	1
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L87
Date Collected: 12/09/14 12:20
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-10
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 01:16	1
N-Nitrosodimethylamine	**0.43**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 01:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*42*		*25 - 150*	*12/15/14 10:45*	*12/24/14 01:16*	*1*
N-Nitrosodi-n-propylamine-d14	*70*		*25 - 150*	*12/15/14 10:45*	*12/24/14 01:16*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		2.0	0.80	mg/L			12/17/14 17:58	4
Sulfate	**17**		1.0	0.40	mg/L			12/17/14 14:07	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.55**	**J**	10	0.55	ug/L		12/12/14 09:47	12/15/14 10:41	1
Sodium	**27000**	**B**	5000	180	ug/L		12/12/14 09:47	12/15/14 10:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.13**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	**0.30**		0.050	0.010	mg/L			12/11/14 10:35	1
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:35	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L116
Date Collected: 12/09/14 12:35
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-11
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		12/15/14 10:45	12/24/14 01:54	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		12/15/14 10:45	12/24/14 01:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*41*		*25 - 150*	*12/15/14 10:45*	*12/24/14 01:54*	*1*
N-Nitrosodi-n-propylamine-d14	*62*		*25 - 150*	*12/15/14 10:45*	*12/24/14 01:54*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L66
Date Collected: 12/09/14 13:06
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-12
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 02:32	1
N-Nitrosodimethylamine	**0.70**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 02:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*37*		*25 - 150*	*12/15/14 10:45*	*12/24/14 02:32*	*1*
N-Nitrosodi-n-propylamine-d14	*65*		*25 - 150*	*12/15/14 10:45*	*12/24/14 02:32*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.2**		0.50	0.20	mg/L			12/17/14 14:53	1
Sulfate	**8.2**		1.0	0.40	mg/L			12/17/14 14:53	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 10:45	1
Sodium	**3000**	**J B**	5000	180	ug/L		12/12/14 09:47	12/15/14 10:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.10**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	ND		0.050	0.010	mg/L			12/11/14 10:37	1
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:37	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L94
Date Collected: 12/09/14 13:22
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Nitrophenol	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzaldehyde	ND		0.95	0.37	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		12/15/14 06:57	12/18/14 15:54	1
Fluorene	ND		0.19	0.039	ug/L		12/15/14 06:57	12/18/14 15:54	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		12/15/14 06:57	12/18/14 15:54	1
Carbazole	ND		0.95	0.27	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzyl alcohol	ND		4.8	0.36	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		12/15/14 06:57	12/18/14 15:54	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		12/15/14 06:57	12/18/14 15:54	1
4-Nitroaniline	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 15:54	1
Aniline	ND		4.8	0.32	ug/L		12/15/14 06:57	12/18/14 15:54	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		12/15/14 06:57	12/18/14 15:54	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		12/15/14 06:57	12/18/14 15:54	1
Acenaphthylene	ND		0.19	0.046	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Chlorophenol	ND		0.95	0.28	ug/L		12/15/14 06:57	12/18/14 15:54	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Nitroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:54	1
Pentachlorophenol	ND		4.8	0.26	ug/L		12/15/14 06:57	12/18/14 15:54	1
Dibenzofuran	ND		0.95	0.019	ug/L		12/15/14 06:57	12/18/14 15:54	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		12/15/14 06:57	12/18/14 15:54	1
Chrysene	ND		0.19	0.048	ug/L		12/15/14 06:57	12/18/14 15:54	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		12/15/14 06:57	12/18/14 15:54	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		12/15/14 06:57	12/18/14 15:54	1
4-Chloroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		12/15/14 06:57	12/18/14 15:54	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 15:54	1
Azobenzene	ND		9.5	0.28	ug/L		12/15/14 06:57	12/18/14 15:54	1
Atrazine	ND		0.95	0.32	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		12/15/14 06:57	12/18/14 15:54	1
Phenanthrene	ND		0.19	0.059	ug/L		12/15/14 06:57	12/18/14 15:54	1
Caprolactam	**0.35**	**J B**	4.8	0.19	ug/L		12/15/14 06:57	12/18/14 15:54	1
3-Nitroaniline	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 15:54	1
Fluoranthene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 15:54	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Methylphenol	ND		0.95	0.16	ug/L		12/15/14 06:57	12/18/14 15:54	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		12/15/14 06:57	12/18/14 15:54	1
Pyrene	ND		0.19	0.040	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzoic acid	ND		24	9.5	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		12/15/14 06:57	12/18/14 15:54	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		12/15/14 06:57	12/18/14 15:54	1
Acenaphthene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		12/15/14 06:57	12/18/14 15:54	1
Phenyl ether	ND		9.5	1.1	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		12/15/14 06:57	12/18/14 15:54	1

Client Sample ID: OC-M24L94
Date Collected: 12/09/14 13:22
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 15:54	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		12/15/14 06:57	12/18/14 15:54	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		12/15/14 06:57	12/18/14 15:54	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		12/15/14 06:57	12/18/14 15:54	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		12/15/14 06:57	12/18/14 15:54	1
Isophorone	ND		0.95	0.26	ug/L		12/15/14 06:57	12/18/14 15:54	1
Phenol	ND		0.95	0.57	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		12/15/14 06:57	12/18/14 15:54	1
Diethyl phthalate	ND		1.9	0.57	ug/L		12/15/14 06:57	12/18/14 15:54	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		12/15/14 06:57	12/18/14 15:54	1
Nitrobenzene	ND		0.95	0.038	ug/L		12/15/14 06:57	12/18/14 15:54	1
Anthracene	ND		0.19	0.084	ug/L		12/15/14 06:57	12/18/14 15:54	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		12/15/14 06:57	12/18/14 15:54	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		12/15/14 06:57	12/18/14 15:54	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		12/15/14 06:57	12/18/14 15:54	1
4-Nitrophenol	ND		4.8	0.28	ug/L		12/15/14 06:57	12/18/14 15:54	1
Acetophenone	ND		0.95	0.32	ug/L		12/15/14 06:57	12/18/14 15:54	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		12/15/14 06:57	12/18/14 15:54	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		12/15/14 06:57	12/18/14 15:54	1
Hexachloroethane	ND		0.95	0.18	ug/L		12/15/14 06:57	12/18/14 15:54	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		12/15/14 06:57	12/18/14 15:54	1
Benzophenone	ND		4.8	4.8	ug/L		12/15/14 06:57	12/18/14 15:54	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethanol, 2-[2-(2-butoxyethoxy)ethoxy]	*5.8*	*T J N*	*ug/L*		*8.29*	*143-22-6*	*12/15/14 06:57*	*12/18/14 15:54*	*1*

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Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*77*		*31 - 115*	*12/15/14 06:57*	*12/18/14 15:54*	*1*
2-Fluorobiphenyl (Surr)	*64*		*29 - 110*	*12/15/14 06:57*	*12/18/14 15:54*	*1*
2,4,6-Tribromophenol	*61*		*21 - 128*	*12/15/14 06:57*	*12/18/14 15:54*	*1*
Nitrobenzene-d5	*62*		*31 - 110*	*12/15/14 06:57*	*12/18/14 15:54*	*1*
Phenol-d5	*18*		*10 - 110*	*12/15/14 06:57*	*12/18/14 15:54*	*1*
2-Fluorophenol	*30*		*15 - 110*	*12/15/14 06:57*	*12/18/14 15:54*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 03:10	1
N-Nitrosodimethylamine	**5.1**	**B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 03:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*12/15/14 10:45*	*12/24/14 03:10*	*1*
N-Nitrosodi-n-propylamine-d14	*71*		*25 - 150*	*12/15/14 10:45*	*12/24/14 03:10*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**280**		5.0	2.0	mg/L			12/19/14 11:10	10
Sulfate	**18**		1.0	0.40	mg/L			12/17/14 15:08	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L94
Date Collected: 12/09/14 13:22
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-13
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.62	J	10	0.55	ug/L		12/12/14 09:47	12/15/14 10:49	1
Sodium	120000	B	5000	180	ug/L		12/12/14 09:47	12/15/14 10:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.13		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	2.0		0.25	0.050	mg/L			12/11/14 10:39	5
Nitrite as N	ND		0.25	0.050	mg/L			12/11/14 10:39	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L63
Date Collected: 12/09/14 13:58
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-14
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Nitrophenol	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzaldehyde	ND		0.95	0.37	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		12/15/14 06:57	12/18/14 16:16	1
Fluorene	ND		0.19	0.039	ug/L		12/15/14 06:57	12/18/14 16:16	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		12/15/14 06:57	12/18/14 16:16	1
Carbazole	ND		0.95	0.27	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzyl alcohol	ND		4.8	0.36	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		12/15/14 06:57	12/18/14 16:16	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		12/15/14 06:57	12/18/14 16:16	1
4-Nitroaniline	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 16:16	1
Aniline	ND		4.8	0.32	ug/L		12/15/14 06:57	12/18/14 16:16	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		12/15/14 06:57	12/18/14 16:16	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		12/15/14 06:57	12/18/14 16:16	1
Acenaphthylene	ND		0.19	0.046	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Chlorophenol	ND		0.95	0.28	ug/L		12/15/14 06:57	12/18/14 16:16	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Nitroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 16:16	1
Pentachlorophenol	ND		4.8	0.26	ug/L		12/15/14 06:57	12/18/14 16:16	1
Dibenzofuran	ND		0.95	0.019	ug/L		12/15/14 06:57	12/18/14 16:16	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		12/15/14 06:57	12/18/14 16:16	1
Chrysene	ND		0.19	0.048	ug/L		12/15/14 06:57	12/18/14 16:16	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		12/15/14 06:57	12/18/14 16:16	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		12/15/14 06:57	12/18/14 16:16	1
4-Chloroaniline	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		12/15/14 06:57	12/18/14 16:16	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		12/15/14 06:57	12/18/14 16:16	1
Azobenzene	ND		9.5	0.28	ug/L		12/15/14 06:57	12/18/14 16:16	1
Atrazine	ND		0.95	0.32	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		12/15/14 06:57	12/18/14 16:16	1
Phenanthrene	ND		0.19	0.059	ug/L		12/15/14 06:57	12/18/14 16:16	1
Caprolactam	**0.32**	**J B**	4.8	0.19	ug/L		12/15/14 06:57	12/18/14 16:16	1
3-Nitroaniline	ND		1.9	0.27	ug/L		12/15/14 06:57	12/18/14 16:16	1
Fluoranthene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 16:16	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Methylphenol	ND		0.95	0.16	ug/L		12/15/14 06:57	12/18/14 16:16	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		12/15/14 06:57	12/18/14 16:16	1
Pyrene	ND		0.19	0.040	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzoic acid	ND		24	9.5	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		12/15/14 06:57	12/18/14 16:16	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		12/15/14 06:57	12/18/14 16:16	1
Acenaphthene	ND		0.19	0.042	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		12/15/14 06:57	12/18/14 16:16	1
Phenyl ether	ND		9.5	1.1	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		12/15/14 06:57	12/18/14 16:16	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L63
Date Collected: 12/09/14 13:58
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-14
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		12/15/14 06:57	12/18/14 16:16	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		12/15/14 06:57	12/18/14 16:16	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		12/15/14 06:57	12/18/14 16:16	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		12/15/14 06:57	12/18/14 16:16	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		12/15/14 06:57	12/18/14 16:16	1
Isophorone	ND		0.95	0.26	ug/L		12/15/14 06:57	12/18/14 16:16	1
Phenol	ND		0.95	0.57	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		12/15/14 06:57	12/18/14 16:16	1
Diethyl phthalate	ND		1.9	0.57	ug/L		12/15/14 06:57	12/18/14 16:16	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		12/15/14 06:57	12/18/14 16:16	1
Nitrobenzene	ND		0.95	0.038	ug/L		12/15/14 06:57	12/18/14 16:16	1
Anthracene	ND		0.19	0.084	ug/L		12/15/14 06:57	12/18/14 16:16	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		12/15/14 06:57	12/18/14 16:16	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		12/15/14 06:57	12/18/14 16:16	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		12/15/14 06:57	12/18/14 16:16	1
4-Nitrophenol	ND		4.8	0.28	ug/L		12/15/14 06:57	12/18/14 16:16	1
Acetophenone	ND		0.95	0.32	ug/L		12/15/14 06:57	12/18/14 16:16	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		12/15/14 06:57	12/18/14 16:16	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		12/15/14 06:57	12/18/14 16:16	1
Hexachloroethane	ND		0.95	0.18	ug/L		12/15/14 06:57	12/18/14 16:16	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		12/15/14 06:57	12/18/14 16:16	1
Benzophenone	ND		4.8	4.8	ug/L		12/15/14 06:57	12/18/14 16:16	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethanol, 2-[2-(2-butoxyethoxy)ethoxy]	*4.5*	*T J N*	*ug/L*		*8.29*	*143-22-6*	*12/15/14 06:57*	*12/18/14 16:16*	*1*

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Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*76*		*31 - 115*	*12/15/14 06:57*	*12/18/14 16:16*	*1*
2-Fluorobiphenyl (Surr)	*68*		*29 - 110*	*12/15/14 06:57*	*12/18/14 16:16*	*1*
2,4,6-Tribromophenol	*61*		*21 - 128*	*12/15/14 06:57*	*12/18/14 16:16*	*1*
Nitrobenzene-d5	*69*		*31 - 110*	*12/15/14 06:57*	*12/18/14 16:16*	*1*
Phenol-d5	*19*		*10 - 110*	*12/15/14 06:57*	*12/18/14 16:16*	*1*
2-Fluorophenol	*33*		*15 - 110*	*12/15/14 06:57*	*12/18/14 16:16*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 03:48	1
N-Nitrosodimethylamine	**0.39**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 03:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*12/15/14 10:45*	*12/24/14 03:48*	*1*
N-Nitrosodi-n-propylamine-d14	*70*		*25 - 150*	*12/15/14 10:45*	*12/24/14 03:48*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		2.0	0.80	mg/L			12/17/14 18:44	4
Sulfate	**19**		1.0	0.40	mg/L			12/17/14 15:24	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L63
Date Collected: 12/09/14 13:58
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-14
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.76	J	10	0.55	ug/L		12/12/14 09:47	12/15/14 10:53	1
Sodium	22000	B	5000	180	ug/L		12/12/14 09:47	12/15/14 10:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.14		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	0.57		0.050	0.010	mg/L			12/11/14 10:40	1
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:40	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M15L2C
Date Collected: 12/10/14 11:29
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.044	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Nitrophenol	ND		2.0	0.28	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzaldehyde	ND		0.99	0.39	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		12/16/14 06:55	12/18/14 16:38	1
Fluorene	ND		0.20	0.040	ug/L		12/16/14 06:55	12/18/14 16:38	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		12/16/14 06:55	12/18/14 16:38	1
Carbazole	ND		0.99	0.28	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzyl alcohol	ND		5.0	0.38	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		12/16/14 06:55	12/18/14 16:38	1
3 & 4 Methylphenol	ND		2.0	0.79	ug/L		12/16/14 06:55	12/18/14 16:38	1
4-Nitroaniline	ND		2.0	0.22	ug/L		12/16/14 06:55	12/18/14 16:38	1
Aniline	ND		5.0	0.34	ug/L		12/16/14 06:55	12/18/14 16:38	1
Bis(2-chloroethoxy)methane	ND		0.99	0.32	ug/L		12/16/14 06:55	12/18/14 16:38	1
N-Nitrosodiphenylamine	ND		0.99	0.31	ug/L		12/16/14 06:55	12/18/14 16:38	1
Acenaphthylene	ND		0.20	0.048	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Chlorophenol	ND		0.99	0.29	ug/L		12/16/14 06:55	12/18/14 16:38	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Nitroaniline	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 16:38	1
Pentachlorophenol	ND		5.0	0.27	ug/L		12/16/14 06:55	12/18/14 16:38	1
Dibenzofuran	ND		0.99	0.020	ug/L		12/16/14 06:55	12/18/14 16:38	1
Hexachlorocyclopentadiene	ND		9.9	0.24	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzo[a]anthracene	ND		0.20	0.029	ug/L		12/16/14 06:55	12/18/14 16:38	1
Chrysene	ND		0.20	0.050	ug/L		12/16/14 06:55	12/18/14 16:38	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		12/16/14 06:55	12/18/14 16:38	1
1,2,4,5-Tetrachlorobenzene	ND		0.99	0.54	ug/L		12/16/14 06:55	12/18/14 16:38	1
4-Chloroaniline	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		12/16/14 06:55	12/18/14 16:38	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzo[k]fluoranthene	ND		0.20	0.044	ug/L		12/16/14 06:55	12/18/14 16:38	1
Azobenzene	ND		9.9	0.29	ug/L		12/16/14 06:55	12/18/14 16:38	1
Atrazine	ND		0.99	0.34	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		12/16/14 06:55	12/18/14 16:38	1
Phenanthrene	ND		0.20	0.061	ug/L		12/16/14 06:55	12/18/14 16:38	1
Caprolactam	**0.34**	**J**	5.0	0.20	ug/L		12/16/14 06:55	12/18/14 16:38	1
3-Nitroaniline	ND		2.0	0.28	ug/L		12/16/14 06:55	12/18/14 16:38	1
Fluoranthene	ND		0.20	0.044	ug/L		12/16/14 06:55	12/18/14 16:38	1
1,1'-Biphenyl	ND		0.99	0.13	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Methylphenol	ND		0.99	0.17	ug/L		12/16/14 06:55	12/18/14 16:38	1
N-Nitrosodi-n-propylamine	ND		0.99	0.24	ug/L		12/16/14 06:55	12/18/14 16:38	1
Pyrene	ND		0.20	0.042	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzoic acid	ND		25	9.9	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		12/16/14 06:55	12/18/14 16:38	1
Hexachlorobenzene	ND		0.20	0.084	ug/L		12/16/14 06:55	12/18/14 16:38	1
Acenaphthene	ND		0.20	0.044	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,2'-oxybis[1-chloropropane]	ND		0.99	0.40	ug/L		12/16/14 06:55	12/18/14 16:38	1
Phenyl ether	ND		9.9	1.2	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,3,4,6-Tetrachlorophenol	ND		9.9	0.57	ug/L		12/16/14 06:55	12/18/14 16:38	1

Client Sample ID: OC-M15L2C
Date Collected: 12/10/14 11:29
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 16:38	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		12/16/14 06:55	12/18/14 16:38	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		12/16/14 06:55	12/18/14 16:38	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		12/16/14 06:55	12/18/14 16:38	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		12/16/14 06:55	12/18/14 16:38	1
Isophorone	ND		0.99	0.27	ug/L		12/16/14 06:55	12/18/14 16:38	1
Phenol	ND		0.99	0.59	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,6-Dinitrotoluene	ND		5.0	0.79	ug/L		12/16/14 06:55	12/18/14 16:38	1
Diethyl phthalate	ND		2.0	0.59	ug/L		12/16/14 06:55	12/18/14 16:38	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		12/16/14 06:55	12/18/14 16:38	1
Nitrobenzene	ND		0.99	0.040	ug/L		12/16/14 06:55	12/18/14 16:38	1
Anthracene	ND		0.20	0.087	ug/L		12/16/14 06:55	12/18/14 16:38	1
Bis(2-chloroethyl)ether	ND		0.99	0.099	ug/L		12/16/14 06:55	12/18/14 16:38	1
2-Chloronaphthalene	ND		0.99	0.099	ug/L		12/16/14 06:55	12/18/14 16:38	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		12/16/14 06:55	12/18/14 16:38	1
4-Nitrophenol	ND		5.0	0.29	ug/L		12/16/14 06:55	12/18/14 16:38	1
Acetophenone	ND		0.99	0.34	ug/L		12/16/14 06:55	12/18/14 16:38	1
1,2-Dichlorobenzene	ND		0.99	0.29	ug/L		12/16/14 06:55	12/18/14 16:38	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		12/16/14 06:55	12/18/14 16:38	1
Hexachloroethane	ND		0.99	0.19	ug/L		12/16/14 06:55	12/18/14 16:38	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		12/16/14 06:55	12/18/14 16:38	1
Benzophenone	ND		5.0	5.0	ug/L		12/16/14 06:55	12/18/14 16:38	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.6*	*T J*	*ug/L*		*6.55*		*12/16/14 06:55*	*12/18/14 16:38*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*78*		*31 - 115*	*12/16/14 06:55*	*12/18/14 16:38*	*1*
2-Fluorobiphenyl (Surr)	*62*		*29 - 110*	*12/16/14 06:55*	*12/18/14 16:38*	*1*
2,4,6-Tribromophenol	*52*		*21 - 128*	*12/16/14 06:55*	*12/18/14 16:38*	*1*
Nitrobenzene-d5	*63*		*31 - 110*	*12/16/14 06:55*	*12/18/14 16:38*	*1*
Phenol-d5	*18*		*10 - 110*	*12/16/14 06:55*	*12/18/14 16:38*	*1*
2-Fluorophenol	*29*		*15 - 110*	*12/16/14 06:55*	*12/18/14 16:38*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 04:26	1
N-Nitrosodimethylamine	**0.37**	**J B**	1.9	0.37	ng/L		12/15/14 10:45	12/24/14 04:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*43*		*25 - 150*	*12/15/14 10:45*	*12/24/14 04:26*	*1*
N-Nitrosodi-n-propylamine-d14	*69*		*25 - 150*	*12/15/14 10:45*	*12/24/14 04:26*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		2.0	0.80	mg/L			12/17/14 20:45	4
Sulfate	**30**		1.0	0.40	mg/L			12/17/14 15:39	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M15L2C
Date Collected: 12/10/14 11:29
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-1
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 10:57	1
Sodium	**22000**	**B**	5000	180	ug/L		12/12/14 09:47	12/15/14 10:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.12**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	**0.017**	**J H**	0.050	0.010	mg/L			12/12/14 11:34	1
Nitrite as N	ND	H	0.050	0.010	mg/L			12/12/14 11:34	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/11/14 10:25	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M02L07
Date Collected: 12/10/14 11:57
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Nitrophenol	ND		1.9	0.27	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzaldehyde	ND		0.95	0.37	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		12/16/14 06:55	12/18/14 17:00	1
Fluorene	ND		0.19	0.039	ug/L		12/16/14 06:55	12/18/14 17:00	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		12/16/14 06:55	12/18/14 17:00	1
Carbazole	ND		0.95	0.27	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzyl alcohol	ND		4.8	0.36	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		12/16/14 06:55	12/18/14 17:00	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		12/16/14 06:55	12/18/14 17:00	1
4-Nitroaniline	ND		1.9	0.21	ug/L		12/16/14 06:55	12/18/14 17:00	1
Aniline	ND		4.8	0.32	ug/L		12/16/14 06:55	12/18/14 17:00	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		12/16/14 06:55	12/18/14 17:00	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		12/16/14 06:55	12/18/14 17:00	1
Acenaphthylene	ND		0.19	0.046	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Chlorophenol	ND		0.95	0.28	ug/L		12/16/14 06:55	12/18/14 17:00	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Nitroaniline	ND		1.9	0.20	ug/L		12/16/14 06:55	12/18/14 17:00	1
Pentachlorophenol	ND		4.8	0.26	ug/L		12/16/14 06:55	12/18/14 17:00	1
Dibenzofuran	ND		0.95	0.019	ug/L		12/16/14 06:55	12/18/14 17:00	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		12/16/14 06:55	12/18/14 17:00	1
Chrysene	ND		0.19	0.048	ug/L		12/16/14 06:55	12/18/14 17:00	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		12/16/14 06:55	12/18/14 17:00	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		12/16/14 06:55	12/18/14 17:00	1
4-Chloroaniline	ND		1.9	0.20	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		12/16/14 06:55	12/18/14 17:00	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		12/16/14 06:55	12/18/14 17:00	1
Azobenzene	ND		9.5	0.28	ug/L		12/16/14 06:55	12/18/14 17:00	1
Atrazine	ND		0.95	0.32	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		12/16/14 06:55	12/18/14 17:00	1
Phenanthrene	ND		0.19	0.059	ug/L		12/16/14 06:55	12/18/14 17:00	1
Caprolactam	**0.45**	**J**	4.8	0.19	ug/L		12/16/14 06:55	12/18/14 17:00	1
3-Nitroaniline	ND		1.9	0.27	ug/L		12/16/14 06:55	12/18/14 17:00	1
Fluoranthene	ND		0.19	0.042	ug/L		12/16/14 06:55	12/18/14 17:00	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Methylphenol	ND		0.95	0.16	ug/L		12/16/14 06:55	12/18/14 17:00	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		12/16/14 06:55	12/18/14 17:00	1
Pyrene	ND		0.19	0.040	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzoic acid	ND		24	9.5	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		12/16/14 06:55	12/18/14 17:00	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		12/16/14 06:55	12/18/14 17:00	1
Acenaphthene	ND		0.19	0.042	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		12/16/14 06:55	12/18/14 17:00	1
Phenyl ether	ND		9.5	1.1	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		12/16/14 06:55	12/18/14 17:00	1

Client Sample ID: OC-M02L07
Date Collected: 12/10/14 11:57
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		12/16/14 06:55	12/18/14 17:00	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		12/16/14 06:55	12/18/14 17:00	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		12/16/14 06:55	12/18/14 17:00	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		12/16/14 06:55	12/18/14 17:00	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		12/16/14 06:55	12/18/14 17:00	1
Isophorone	ND		0.95	0.26	ug/L		12/16/14 06:55	12/18/14 17:00	1
Phenol	ND		0.95	0.57	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		12/16/14 06:55	12/18/14 17:00	1
Diethyl phthalate	ND		1.9	0.57	ug/L		12/16/14 06:55	12/18/14 17:00	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		12/16/14 06:55	12/18/14 17:00	1
Nitrobenzene	ND		0.95	0.038	ug/L		12/16/14 06:55	12/18/14 17:00	1
Anthracene	ND		0.19	0.084	ug/L		12/16/14 06:55	12/18/14 17:00	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		12/16/14 06:55	12/18/14 17:00	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		12/16/14 06:55	12/18/14 17:00	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		12/16/14 06:55	12/18/14 17:00	1
4-Nitrophenol	ND		4.8	0.28	ug/L		12/16/14 06:55	12/18/14 17:00	1
Acetophenone	ND		0.95	0.32	ug/L		12/16/14 06:55	12/18/14 17:00	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		12/16/14 06:55	12/18/14 17:00	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		12/16/14 06:55	12/18/14 17:00	1
Hexachloroethane	ND		0.95	0.18	ug/L		12/16/14 06:55	12/18/14 17:00	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		12/16/14 06:55	12/18/14 17:00	1
Benzophenone	ND		4.8	4.8	ug/L		12/16/14 06:55	12/18/14 17:00	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*12/16/14 06:55*	*12/18/14 17:00*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*79*		*31 - 115*	*12/16/14 06:55*	*12/18/14 17:00*	*1*
2-Fluorobiphenyl (Surr)	*66*		*29 - 110*	*12/16/14 06:55*	*12/18/14 17:00*	*1*
2,4,6-Tribromophenol	*52*		*21 - 128*	*12/16/14 06:55*	*12/18/14 17:00*	*1*
Nitrobenzene-d5	*64*		*31 - 110*	*12/16/14 06:55*	*12/18/14 17:00*	*1*
Phenol-d5	*17*		*10 - 110*	*12/16/14 06:55*	*12/18/14 17:00*	*1*
2-Fluorophenol	*28*		*15 - 110*	*12/16/14 06:55*	*12/18/14 17:00*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/15/14 10:45	12/24/14 05:04	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		12/15/14 10:45	12/24/14 05:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*12/15/14 10:45*	*12/24/14 05:04*	*1*
N-Nitrosodi-n-propylamine-d14	*78*		*25 - 150*	*12/15/14 10:45*	*12/24/14 05:04*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**28**		0.50	0.20	mg/L			12/17/14 15:55	1
Sulfate	**18**		1.0	0.40	mg/L			12/17/14 15:55	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M02L07
Date Collected: 12/10/14 11:57
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-2
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 11:01	1
Sodium	**9000**	**B**	5000	180	ug/L		12/12/14 09:47	12/15/14 11:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.089**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 15:47	1
Nitrate as N	**9.4**		1.3	0.25	mg/L			12/12/14 11:38	25
Nitrite as N	ND		1.3	0.25	mg/L			12/12/14 11:38	25

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/11/14 10:25	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M01L6D
Date Collected: 12/15/14 11:27
Date Received: 12/16/14 10:05

Lab Sample ID: 240-45524-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		12/18/14 10:29	12/24/14 09:33	1
N-Nitrosodimethylamine	**2.8**		1.9	0.37	ng/L		12/18/14 10:29	12/24/14 09:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*12/18/14 10:29*	*12/24/14 09:33*	*1*
N-Nitrosodi-n-propylamine-d14	*69*		*25 - 150*	*12/18/14 10:29*	*12/24/14 09:33*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L54
Date Collected: 12/15/14 15:14
Date Received: 12/16/14 10:05

Lab Sample ID: 240-45524-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Nitrophenol	ND		1.9	0.27	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzaldehyde	ND		0.95	0.37	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		12/19/14 07:04	12/20/14 11:52	1
Fluorene	ND		0.19	0.039	ug/L		12/19/14 07:04	12/20/14 11:52	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		12/19/14 07:04	12/20/14 11:52	1
Carbazole	ND		0.95	0.27	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzyl alcohol	ND		4.8	0.36	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		12/19/14 07:04	12/20/14 11:52	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		12/19/14 07:04	12/20/14 11:52	1
4-Nitroaniline	ND		1.9	0.21	ug/L		12/19/14 07:04	12/20/14 11:52	1
Aniline	ND		4.8	0.32	ug/L		12/19/14 07:04	12/20/14 11:52	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		12/19/14 07:04	12/20/14 11:52	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		12/19/14 07:04	12/20/14 11:52	1
Acenaphthylene	ND		0.19	0.046	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Chlorophenol	ND		0.95	0.28	ug/L		12/19/14 07:04	12/20/14 11:52	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Nitroaniline	ND		1.9	0.20	ug/L		12/19/14 07:04	12/20/14 11:52	1
Pentachlorophenol	ND		4.8	0.26	ug/L		12/19/14 07:04	12/20/14 11:52	1
Dibenzofuran	ND		0.95	0.019	ug/L		12/19/14 07:04	12/20/14 11:52	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		12/19/14 07:04	12/20/14 11:52	1
Chrysene	ND		0.19	0.048	ug/L		12/19/14 07:04	12/20/14 11:52	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		12/19/14 07:04	12/20/14 11:52	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		12/19/14 07:04	12/20/14 11:52	1
4-Chloroaniline	ND		1.9	0.20	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		12/19/14 07:04	12/20/14 11:52	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		12/19/14 07:04	12/20/14 11:52	1
Azobenzene	ND		9.5	0.28	ug/L		12/19/14 07:04	12/20/14 11:52	1
Atrazine	ND		0.95	0.32	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		12/19/14 07:04	12/20/14 11:52	1
Phenanthrene	ND		0.19	0.059	ug/L		12/19/14 07:04	12/20/14 11:52	1
Caprolactam	ND		4.8	0.19	ug/L		12/19/14 07:04	12/20/14 11:52	1
3-Nitroaniline	ND		1.9	0.27	ug/L		12/19/14 07:04	12/20/14 11:52	1
Fluoranthene	ND		0.19	0.042	ug/L		12/19/14 07:04	12/20/14 11:52	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Methylphenol	ND		0.95	0.16	ug/L		12/19/14 07:04	12/20/14 11:52	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		12/19/14 07:04	12/20/14 11:52	1
Pyrene	ND		0.19	0.040	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzoic acid	ND		24	9.5	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		12/19/14 07:04	12/20/14 11:52	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		12/19/14 07:04	12/20/14 11:52	1
Acenaphthene	ND		0.19	0.042	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		12/19/14 07:04	12/20/14 11:52	1
Phenyl ether	ND		9.5	1.1	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		12/19/14 07:04	12/20/14 11:52	1

Client Sample ID: OC-M24L54
Date Collected: 12/15/14 15:14
Date Received: 12/16/14 10:05

Lab Sample ID: 240-45524-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		12/19/14 07:04	12/20/14 11:52	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		12/19/14 07:04	12/20/14 11:52	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		12/19/14 07:04	12/20/14 11:52	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		12/19/14 07:04	12/20/14 11:52	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		12/19/14 07:04	12/20/14 11:52	1
Isophorone	ND		0.95	0.26	ug/L		12/19/14 07:04	12/20/14 11:52	1
Phenol	ND		0.95	0.57	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		12/19/14 07:04	12/20/14 11:52	1
Diethyl phthalate	ND		1.9	0.57	ug/L		12/19/14 07:04	12/20/14 11:52	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		12/19/14 07:04	12/20/14 11:52	1
Nitrobenzene	ND		0.95	0.038	ug/L		12/19/14 07:04	12/20/14 11:52	1
Anthracene	ND		0.19	0.084	ug/L		12/19/14 07:04	12/20/14 11:52	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		12/19/14 07:04	12/20/14 11:52	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		12/19/14 07:04	12/20/14 11:52	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		12/19/14 07:04	12/20/14 11:52	1
4-Nitrophenol	ND		4.8	0.28	ug/L		12/19/14 07:04	12/20/14 11:52	1
Acetophenone	ND		0.95	0.32	ug/L		12/19/14 07:04	12/20/14 11:52	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		12/19/14 07:04	12/20/14 11:52	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		12/19/14 07:04	12/20/14 11:52	1
Hexachloroethane	ND		0.95	0.18	ug/L		12/19/14 07:04	12/20/14 11:52	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		12/19/14 07:04	12/20/14 11:52	1
Benzophenone	ND		4.8	4.8	ug/L		12/19/14 07:04	12/20/14 11:52	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*2.2*	*T J*	*ug/L*		*6.57*		*12/19/14 07:04*	*12/20/14 11:52*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*70*		*31 - 115*	*12/19/14 07:04*	*12/20/14 11:52*	*1*
2-Fluorobiphenyl (Surr)	*61*		*29 - 110*	*12/19/14 07:04*	*12/20/14 11:52*	*1*
2,4,6-Tribromophenol	*54*		*21 - 128*	*12/19/14 07:04*	*12/20/14 11:52*	*1*
Nitrobenzene-d5	*55*		*31 - 110*	*12/19/14 07:04*	*12/20/14 11:52*	*1*
Phenol-d5	*13*		*10 - 110*	*12/19/14 07:04*	*12/20/14 11:52*	*1*
2-Fluorophenol	*24*		*15 - 110*	*12/19/14 07:04*	*12/20/14 11:52*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		12/18/14 10:29	12/20/14 06:15	1
N-Nitrosodimethylamine	**22**		1.9	0.37	ng/L		12/18/14 10:29	12/20/14 06:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*12/18/14 10:29*	*12/20/14 06:15*	*1*
N-Nitrosodi-n-propylamine-d14	*83*		*25 - 150*	*12/18/14 10:29*	*12/20/14 06:15*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**79**		1.0	0.40	mg/L			12/24/14 11:27	2
Sulfate	**28**		1.0	0.40	mg/L			12/20/14 15:02	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L54
Date Collected: 12/15/14 15:14
Date Received: 12/16/14 10:05

Lab Sample ID: 240-45524-2
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/17/14 09:57	12/18/14 13:46	1
Sodium	**23000**		5000	180	ug/L		12/17/14 09:57	12/18/14 13:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	**0.11**		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 14:53	1
Nitrate as N	ND		0.050	0.010	mg/L			12/17/14 10:30	1
Nitrite as N	ND		0.050	0.010	mg/L			12/17/14 10:30	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/16/14 11:46	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
		TPH	FBP	TBP	NBZ	PHL	2FP
Lab Sample ID	Client Sample ID	(31-115)	(29-110)	(21-128)	(31-110)	(10-110)	(15-110)
240-45265-9	OC-M24L64	78	64	57	63	16	28
240-45265-13	OC-M24L94	77	64	61	62	18	30
240-45265-14	OC-M24L63	76	68	61	69	19	33
240-45331-1	OC-M15L2C	78	62	52	63	18	29
240-45331-2	OC-M02L07	79	66	52	64	17	28
240-45524-2	OC-M24L54	70	61	54	55	13	24
LCS 240-160933/5-A	Lab Control Sample	90	80	94	83	37	56
LCS 240-161139/17-A	Lab Control Sample	90	81	94	79	31	47
LCS 240-161776/12-A	Lab Control Sample	84	75	85	71	34	50
LCSD 240-160933/6-A	Lab Control Sample Dup	95	85	101	85	36	54
LCSD 240-161139/18-A	Lab Control Sample Dup	83	78	93	77	31	48
LCSD 240-161776/13-A	Lab Control Sample Dup	84	75	87	72	32	49
MB 240-160933/4-A	Method Blank	93	78	66	79	35	53
MB 240-161139/16-A	Method Blank	86	72	65	71	30	46
MB 240-161776/11-A	Method Blank	83	67	57	60	32	47

Surrogate Legend

TPH = Terphenyl-d14 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
2FP = 2-Fluorophenol

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-160933/4-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 160933

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Nitrophenol	ND		2.0	0.28	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzaldehyde	ND		1.0	0.39	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		12/15/14 06:57	12/18/14 12:55	1
Fluorene	ND		0.20	0.041	ug/L		12/15/14 06:57	12/18/14 12:55	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		12/15/14 06:57	12/18/14 12:55	1
Carbazole	ND		1.0	0.28	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzyl alcohol	ND		5.0	0.38	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		12/15/14 06:57	12/18/14 12:55	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Nitroaniline	ND		2.0	0.22	ug/L		12/15/14 06:57	12/18/14 12:55	1
Aniline	ND		5.0	0.34	ug/L		12/15/14 06:57	12/18/14 12:55	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		12/15/14 06:57	12/18/14 12:55	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		12/15/14 06:57	12/18/14 12:55	1
Acenaphthylene	ND		0.20	0.048	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Chlorophenol	ND		1.0	0.29	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Nitroaniline	ND		2.0	0.21	ug/L		12/15/14 06:57	12/18/14 12:55	1
Pentachlorophenol	ND		5.0	0.27	ug/L		12/15/14 06:57	12/18/14 12:55	1
Dibenzofuran	ND		1.0	0.020	ug/L		12/15/14 06:57	12/18/14 12:55	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzo[a]anthracene	ND		0.20	0.030	ug/L		12/15/14 06:57	12/18/14 12:55	1
Chrysene	ND		0.20	0.050	ug/L		12/15/14 06:57	12/18/14 12:55	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		12/15/14 06:57	12/18/14 12:55	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Chloroaniline	ND		2.0	0.21	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		12/15/14 06:57	12/18/14 12:55	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		12/15/14 06:57	12/18/14 12:55	1
Azobenzene	ND		10	0.29	ug/L		12/15/14 06:57	12/18/14 12:55	1
Atrazine	ND		1.0	0.34	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		12/15/14 06:57	12/18/14 12:55	1
Phenanthrene	ND		0.20	0.062	ug/L		12/15/14 06:57	12/18/14 12:55	1
Caprolactam	0.489	J	5.0	0.20	ug/L		12/15/14 06:57	12/18/14 12:55	1
3-Nitroaniline	ND		2.0	0.28	ug/L		12/15/14 06:57	12/18/14 12:55	1
Fluoranthene	ND		0.20	0.045	ug/L		12/15/14 06:57	12/18/14 12:55	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Methylphenol	ND		1.0	0.17	ug/L		12/15/14 06:57	12/18/14 12:55	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		12/15/14 06:57	12/18/14 12:55	1
Pyrene	ND		0.20	0.042	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzoic acid	ND		25	10	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		12/15/14 06:57	12/18/14 12:55	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		12/15/14 06:57	12/18/14 12:55	1
Acenaphthene	ND		0.20	0.044	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		12/15/14 06:57	12/18/14 12:55	1
Phenyl ether	ND		10	1.2	ug/L		12/15/14 06:57	12/18/14 12:55	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-160933/4-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 160933

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		12/15/14 06:57	12/18/14 12:55	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		12/15/14 06:57	12/18/14 12:55	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		12/15/14 06:57	12/18/14 12:55	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		12/15/14 06:57	12/18/14 12:55	1
Isophorone	ND		1.0	0.27	ug/L		12/15/14 06:57	12/18/14 12:55	1
Phenol	ND		1.0	0.60	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		12/15/14 06:57	12/18/14 12:55	1
Diethyl phthalate	ND		2.0	0.60	ug/L		12/15/14 06:57	12/18/14 12:55	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		12/15/14 06:57	12/18/14 12:55	1
Nitrobenzene	ND		1.0	0.040	ug/L		12/15/14 06:57	12/18/14 12:55	1
Anthracene	ND		0.20	0.088	ug/L		12/15/14 06:57	12/18/14 12:55	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		12/15/14 06:57	12/18/14 12:55	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		12/15/14 06:57	12/18/14 12:55	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		12/15/14 06:57	12/18/14 12:55	1
4-Nitrophenol	ND		5.0	0.29	ug/L		12/15/14 06:57	12/18/14 12:55	1
Acetophenone	ND		1.0	0.34	ug/L		12/15/14 06:57	12/18/14 12:55	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		12/15/14 06:57	12/18/14 12:55	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		12/15/14 06:57	12/18/14 12:55	1
Hexachloroethane	ND		1.0	0.19	ug/L		12/15/14 06:57	12/18/14 12:55	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		12/15/14 06:57	12/18/14 12:55	1
Benzophenone	ND		5.0	5.0	ug/L		12/15/14 06:57	12/18/14 12:55	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Ethanol, 2-[2-(2-butoxyethoxy)ethoxy]-	*4.48*	*T J N*	*ug/L*		*8.30*	*143-22-6*	*12/15/14 06:57*	*12/18/14 12:55*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*93*		*31 - 115*	*12/15/14 06:57*	*12/18/14 12:55*	*1*
2-Fluorobiphenyl (Surr)	*78*		*29 - 110*	*12/15/14 06:57*	*12/18/14 12:55*	*1*
2,4,6-Tribromophenol	*66*		*21 - 128*	*12/15/14 06:57*	*12/18/14 12:55*	*1*
Nitrobenzene-d5	*79*		*31 - 110*	*12/15/14 06:57*	*12/18/14 12:55*	*1*
Phenol-d5	*35*		*10 - 110*	*12/15/14 06:57*	*12/18/14 12:55*	*1*
2-Fluorophenol	*53*		*15 - 110*	*12/15/14 06:57*	*12/18/14 12:55*	*1*

Lab Sample ID: LCS 240-160933/5-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 160933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	15.9		ug/L		79	24 - 125
2-Nitrophenol	20.0	17.2		ug/L		86	42 - 120
Benzaldehyde	40.0	30.6		ug/L		77	40 - 122
2,4-Dimethylphenol	20.0	16.0		ug/L		80	38 - 120
Fluorene	20.0	15.3		ug/L		76	56 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-160933/5-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 160933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Di-n-octyl phthalate	20.0	16.6		ug/L		83	21 - 122
Carbazole	20.0	16.3		ug/L		82	57 - 120
Benzyl alcohol	20.0	14.4		ug/L		72	23 - 110
Benzo[a]pyrene	20.0	17.0		ug/L		85	24 - 120
3 & 4 Methylphenol	20.0	13.3		ug/L		67	34 - 120
4-Nitroaniline	20.0	17.1		ug/L		85	48 - 120
Aniline	20.0	14.4		ug/L		72	10 - 123
Bis(2-chloroethoxy)methane	20.0	16.3		ug/L		82	48 - 120
N-Nitrosodiphenylamine	40.0	31.8		ug/L		80	51 - 120
Acenaphthylene	20.0	15.1		ug/L		76	55 - 120
2-Chlorophenol	20.0	16.0		ug/L		80	43 - 120
4-Bromophenyl phenyl ether	20.0	16.0		ug/L		80	47 - 120
2-Nitroaniline	20.0	17.9		ug/L		90	48 - 127
Pentachlorophenol	40.0	24.1		ug/L		60	14 - 120
Dibenzofuran	20.0	15.7		ug/L		79	56 - 120
Hexachlorocyclopentadiene	20.0	8.98	J	ug/L		45	4 - 120
Benzo[a]anthracene	20.0	15.6		ug/L		78	46 - 120
Chrysene	20.0	15.9		ug/L		79	49 - 120
4,6-Dinitro-2-methylphenol	40.0	25.2		ug/L		63	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	14.4		ug/L		72	40 - 160
4-Chloroaniline	20.0	16.5		ug/L		82	15 - 120
2,4-Dinitrotoluene	20.0	17.3		ug/L		86	52 - 120
1-Methylnaphthalene	20.0	16.8		ug/L		84	54 - 110
Benzo[k]fluoranthene	20.0	17.3		ug/L		87	30 - 120
Azobenzene	20.0	22.1		ug/L		110	50 - 150
Atrazine	40.0	32.4		ug/L		81	65 - 161
Benzo[g,h,i]perylene	20.0	15.3		ug/L		77	24 - 126
2,4-Dichlorophenol	20.0	16.8		ug/L		84	46 - 120
Phenanthrene	20.0	15.9		ug/L		79	57 - 120
Caprolactam	40.0	11.1		ug/L		28	10 - 120
3-Nitroaniline	20.0	16.8		ug/L		84	52 - 120
Fluoranthene	20.0	16.8		ug/L		84	57 - 120
1,1'-Biphenyl	20.0	15.0		ug/L		75	52 - 120
Benzo[b]fluoranthene	20.0	16.5		ug/L		83	24 - 120
2-Methylphenol	20.0	14.3		ug/L		71	38 - 120
N-Nitrosodi-n-propylamine	20.0	15.9		ug/L		80	48 - 123
Pyrene	20.0	16.4		ug/L		82	50 - 120
Benzoic acid	40.0	ND		ug/L		17	10 - 110
2-Methylnaphthalene	20.0	16.8		ug/L		84	52 - 120
Hexachlorobenzene	20.0	15.7		ug/L		79	52 - 120
Acenaphthene	20.0	15.4		ug/L		77	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	15.5		ug/L		77	42 - 120
Phenyl ether	20.0	16.5		ug/L		83	40 - 160
2,3,4,6-Tetrachlorophenol	20.0	14.6		ug/L		73	50 - 150
4-Chloro-3-methylphenol	20.0	16.7		ug/L		83	45 - 120
4-Chlorophenyl phenyl ether	20.0	15.9		ug/L		80	47 - 120
Bis(2-ethylhexyl) phthalate	20.0	18.0		ug/L		90	21 - 125
Butyl benzyl phthalate	20.0	16.4		ug/L		82	51 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-160933/5-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 160933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Di-n-butyl phthalate	20.0	16.7		ug/L		83	57 - 122
Isophorone	20.0	15.6		ug/L		78	48 - 123
Phenol	20.0	7.17		ug/L		36	16 - 120
2,6-Dinitrotoluene	20.0	16.9		ug/L		85	52 - 120
Diethyl phthalate	20.0	16.4		ug/L		82	58 - 120
Indeno[1,2,3-cd]pyrene	20.0	16.2		ug/L		81	25 - 120
2,4,6-Trichlorophenol	20.0	15.3		ug/L		76	43 - 120
2,4,5-Trichlorophenol	20.0	15.6		ug/L		78	47 - 120
Nitrobenzene	20.0	15.5		ug/L		77	41 - 120
Anthracene	20.0	15.9		ug/L		79	56 - 120
Bis(2-chloroethyl)ether	20.0	16.0		ug/L		80	43 - 120
2-Chloronaphthalene	20.0	14.9		ug/L		74	47 - 120
2,4-Dinitrophenol	40.0	14.7		ug/L		37	10 - 120
4-Nitrophenol	40.0	14.9		ug/L		37	16 - 120
Acetophenone	20.0	16.5		ug/L		83	50 - 120
1,2-Dichlorobenzene	20.0	15.2		ug/L		76	52 - 110
3,3'-Dichlorobenzidine	40.0	32.6		ug/L		82	29 - 120
Hexachloroethane	20.0	13.8		ug/L		69	42 - 120
Dimethyl phthalate	20.0	16.3		ug/L		82	59 - 120
Benzophenone	20.0	21.8		ug/L		109	10 - 160

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*90*		*31 - 115*
2-Fluorobiphenyl (Surr)	*80*		*29 - 110*
2,4,6-Tribromophenol	*94*		*21 - 128*
Nitrobenzene-d5	*83*		*31 - 110*
Phenol-d5	*37*		*10 - 110*
2-Fluorophenol	*56*		*15 - 110*

Lab Sample ID: LCSD 240-160933/6-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 160933

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene	20.0	16.6		ug/L		83	24 - 125	5	30
2-Nitrophenol	20.0	18.2		ug/L		91	42 - 120	6	30
Benzaldehyde	40.0	30.6		ug/L		76	40 - 122	0	30
2,4-Dimethylphenol	20.0	16.5		ug/L		83	38 - 120	3	30
Fluorene	20.0	16.3		ug/L		82	56 - 120	7	30
Di-n-octyl phthalate	20.0	17.7		ug/L		89	21 - 122	7	30
Carbazole	20.0	17.1		ug/L		85	57 - 120	4	30
Benzyl alcohol	20.0	14.2		ug/L		71	23 - 110	2	30
Benzo[a]pyrene	20.0	18.2		ug/L		91	24 - 120	6	30
3 & 4 Methylphenol	20.0	13.0		ug/L		65	34 - 120	2	30
4-Nitroaniline	20.0	17.9		ug/L		90	48 - 120	5	30
Aniline	20.0	13.9		ug/L		70	10 - 123	4	30
Bis(2-chloroethoxy)methane	20.0	16.5		ug/L		82	48 - 120	1	30
N-Nitrosodiphenylamine	40.0	33.2		ug/L		83	51 - 120	4	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-160933/6-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 160933

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthylene	20.0	16.0		ug/L		80	55 - 120	6	30
2-Chlorophenol	20.0	15.6		ug/L		78	43 - 120	3	30
4-Bromophenyl phenyl ether	20.0	16.9		ug/L		84	47 - 120	5	30
2-Nitroaniline	20.0	19.2		ug/L		96	48 - 127	7	30
Pentachlorophenol	40.0	25.7		ug/L		64	14 - 120	6	30
Dibenzofuran	20.0	16.9		ug/L		84	56 - 120	7	30
Hexachlorocyclopentadiene	20.0	10.2		ug/L		51	4 - 120	13	30
Benzo[a]anthracene	20.0	16.6		ug/L		83	46 - 120	6	30
Chrysene	20.0	16.9		ug/L		84	49 - 120	6	30
4,6-Dinitro-2-methylphenol	40.0	27.0		ug/L		68	33 - 120	7	30
1,2,4,5-Tetrachlorobenzene	20.0	15.2		ug/L		76	40 - 160	5	30
4-Chloroaniline	20.0	16.8		ug/L		84	15 - 120	2	30
2,4-Dinitrotoluene	20.0	18.4		ug/L		92	52 - 120	6	30
1-Methylnaphthalene	20.0	17.5		ug/L		88	54 - 110	4	30
Benzo[k]fluoranthene	20.0	17.6		ug/L		88	30 - 120	2	30
Azobenzene	20.0	23.0		ug/L		115	50 - 150	4	30
Atrazine	40.0	34.1		ug/L		85	65 - 161	5	30
Benzo[g,h,i]perylene	20.0	16.2		ug/L		81	24 - 126	6	30
2,4-Dichlorophenol	20.0	17.6		ug/L		88	46 - 120	5	30
Phenanthrene	20.0	16.3		ug/L		82	57 - 120	3	30
Caprolactam	40.0	11.8		ug/L		29	10 - 120	6	30
3-Nitroaniline	20.0	17.8		ug/L		89	52 - 120	6	30
Fluoranthene	20.0	17.8		ug/L		89	57 - 120	6	30
1,1'-Biphenyl	20.0	16.1		ug/L		80	52 - 120	7	30
Benzo[b]fluoranthene	20.0	18.2		ug/L		91	24 - 120	10	30
2-Methylphenol	20.0	13.7		ug/L		68	38 - 120	4	30
N-Nitrosodi-n-propylamine	20.0	16.0		ug/L		80	48 - 123	0	30
Pyrene	20.0	17.3		ug/L		87	50 - 120	5	30
Benzoic acid	40.0	ND		ug/L		18	10 - 110	7	30
2-Methylnaphthalene	20.0	17.3		ug/L		86	52 - 120	3	30
Hexachlorobenzene	20.0	16.3		ug/L		82	52 - 120	4	30
Acenaphthene	20.0	16.5		ug/L		82	55 - 120	6	30
2,2'-oxybis[1-chloropropane]	20.0	15.3		ug/L		76	42 - 120	1	30
Phenyl ether	20.0	17.7		ug/L		88	40 - 160	7	30
2,3,4,6-Tetrachlorophenol	20.0	15.8		ug/L		79	50 - 150	8	30
4-Chloro-3-methylphenol	20.0	17.1		ug/L		86	45 - 120	3	30
4-Chlorophenyl phenyl ether	20.0	16.9		ug/L		84	47 - 120	6	30
Bis(2-ethylhexyl) phthalate	20.0	18.9		ug/L		94	21 - 125	5	30
Butyl benzyl phthalate	20.0	17.6		ug/L		88	51 - 120	7	30
Di-n-butyl phthalate	20.0	17.3		ug/L		87	57 - 122	4	30
Isophorone	20.0	16.2		ug/L		81	48 - 123	4	30
Phenol	20.0	6.90		ug/L		35	16 - 120	4	30
2,6-Dinitrotoluene	20.0	18.0		ug/L		90	52 - 120	6	30
Diethyl phthalate	20.0	17.4		ug/L		87	58 - 120	6	30
Indeno[1,2,3-cd]pyrene	20.0	17.3		ug/L		87	25 - 120	7	30
2,4,6-Trichlorophenol	20.0	16.1		ug/L		80	43 - 120	5	30
2,4,5-Trichlorophenol	20.0	16.1		ug/L		81	47 - 120	4	30
Nitrobenzene	20.0	15.7		ug/L		79	41 - 120	2	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-160933/6-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 160933

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Anthracene			20.0	16.7		ug/L		84	56 - 120	5	30
Bis(2-chloroethyl)ether			20.0	15.7		ug/L		79	43 - 120	2	30
2-Chloronaphthalene			20.0	15.8		ug/L		79	47 - 120	6	30
2,4-Dinitrophenol			40.0	16.5		ug/L		41	10 - 120	11	30
4-Nitrophenol			40.0	16.2		ug/L		41	16 - 120	9	30
Acetophenone			20.0	16.3		ug/L		82	50 - 120	1	30
1,2-Dichlorobenzene			20.0	15.0		ug/L		75	52 - 110	2	30
3,3'-Dichlorobenzidine			40.0	34.7		ug/L		87	29 - 120	6	30
Hexachloroethane			20.0	13.5		ug/L		67	42 - 120	2	30
Dimethyl phthalate			20.0	17.4		ug/L		87	59 - 120	6	30
Benzophenone			20.0	23.5		ug/L		117	10 - 160	7	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*95*		*31 - 115*
2-Fluorobiphenyl (Surr)	*85*		*29 - 110*
2,4,6-Tribromophenol	*101*		*21 - 128*
Nitrobenzene-d5	*85*		*31 - 110*
Phenol-d5	*36*		*10 - 110*
2-Fluorophenol	*54*		*15 - 110*

Lab Sample ID: MB 240-161139/16-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161139

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Nitrophenol	ND		2.0	0.28	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzaldehyde	ND		1.0	0.39	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		12/16/14 06:55	12/18/14 14:24	1
Fluorene	ND		0.20	0.041	ug/L		12/16/14 06:55	12/18/14 14:24	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		12/16/14 06:55	12/18/14 14:24	1
Carbazole	ND		1.0	0.28	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzyl alcohol	ND		5.0	0.38	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		12/16/14 06:55	12/18/14 14:24	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Nitroaniline	ND		2.0	0.22	ug/L		12/16/14 06:55	12/18/14 14:24	1
Aniline	ND		5.0	0.34	ug/L		12/16/14 06:55	12/18/14 14:24	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		12/16/14 06:55	12/18/14 14:24	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		12/16/14 06:55	12/18/14 14:24	1
Acenaphthylene	ND		0.20	0.048	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Chlorophenol	ND		1.0	0.29	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Nitroaniline	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 14:24	1
Pentachlorophenol	ND		5.0	0.27	ug/L		12/16/14 06:55	12/18/14 14:24	1
Dibenzofuran	ND		1.0	0.020	ug/L		12/16/14 06:55	12/18/14 14:24	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzo[a]anthracene	ND		0.20	0.030	ug/L		12/16/14 06:55	12/18/14 14:24	1
Chrysene	ND		0.20	0.050	ug/L		12/16/14 06:55	12/18/14 14:24	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-161139/16-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161139

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		12/16/14 06:55	12/18/14 14:24	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Chloroaniline	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		12/16/14 06:55	12/18/14 14:24	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		12/16/14 06:55	12/18/14 14:24	1
Azobenzene	ND		10	0.29	ug/L		12/16/14 06:55	12/18/14 14:24	1
Atrazine	ND		1.0	0.34	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		12/16/14 06:55	12/18/14 14:24	1
Phenanthrene	ND		0.20	0.062	ug/L		12/16/14 06:55	12/18/14 14:24	1
Caprolactam	ND		5.0	0.20	ug/L		12/16/14 06:55	12/18/14 14:24	1
3-Nitroaniline	ND		2.0	0.28	ug/L		12/16/14 06:55	12/18/14 14:24	1
Fluoranthene	ND		0.20	0.045	ug/L		12/16/14 06:55	12/18/14 14:24	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Methylphenol	ND		1.0	0.17	ug/L		12/16/14 06:55	12/18/14 14:24	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		12/16/14 06:55	12/18/14 14:24	1
Pyrene	ND		0.20	0.042	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzoic acid	ND		25	10	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		12/16/14 06:55	12/18/14 14:24	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		12/16/14 06:55	12/18/14 14:24	1
Acenaphthene	ND		0.20	0.044	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		12/16/14 06:55	12/18/14 14:24	1
Phenyl ether	ND		10	1.2	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		12/16/14 06:55	12/18/14 14:24	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		12/16/14 06:55	12/18/14 14:24	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		12/16/14 06:55	12/18/14 14:24	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		12/16/14 06:55	12/18/14 14:24	1
Isophorone	ND		1.0	0.27	ug/L		12/16/14 06:55	12/18/14 14:24	1
Phenol	ND		1.0	0.60	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		12/16/14 06:55	12/18/14 14:24	1
Diethyl phthalate	ND		2.0	0.60	ug/L		12/16/14 06:55	12/18/14 14:24	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		12/16/14 06:55	12/18/14 14:24	1
Nitrobenzene	ND		1.0	0.040	ug/L		12/16/14 06:55	12/18/14 14:24	1
Anthracene	ND		0.20	0.088	ug/L		12/16/14 06:55	12/18/14 14:24	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		12/16/14 06:55	12/18/14 14:24	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		12/16/14 06:55	12/18/14 14:24	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		12/16/14 06:55	12/18/14 14:24	1
4-Nitrophenol	ND		5.0	0.29	ug/L		12/16/14 06:55	12/18/14 14:24	1
Acetophenone	ND		1.0	0.34	ug/L		12/16/14 06:55	12/18/14 14:24	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		12/16/14 06:55	12/18/14 14:24	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		12/16/14 06:55	12/18/14 14:24	1
Hexachloroethane	ND		1.0	0.19	ug/L		12/16/14 06:55	12/18/14 14:24	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-161139/16-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161139

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dimethyl phthalate	ND		2.0	0.29	ug/L		12/16/14 06:55	12/18/14 14:24	1
Benzophenone	ND		5.0	5.0	ug/L		12/16/14 06:55	12/18/14 14:24	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*12/16/14 06:55*	*12/18/14 14:24*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*86*		*31 - 115*	*12/16/14 06:55*	*12/18/14 14:24*	*1*
2-Fluorobiphenyl (Surr)	*72*		*29 - 110*	*12/16/14 06:55*	*12/18/14 14:24*	*1*
2,4,6-Tribromophenol	*65*		*21 - 128*	*12/16/14 06:55*	*12/18/14 14:24*	*1*
Nitrobenzene-d5	*71*		*31 - 110*	*12/16/14 06:55*	*12/18/14 14:24*	*1*
Phenol-d5	*30*		*10 - 110*	*12/16/14 06:55*	*12/18/14 14:24*	*1*
2-Fluorophenol	*46*		*15 - 110*	*12/16/14 06:55*	*12/18/14 14:24*	*1*

Lab Sample ID: LCS 240-161139/17-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161139

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	15.1		ug/L		76	24 - 125
2-Nitrophenol	20.0	16.5		ug/L		82	42 - 120
Benzaldehyde	40.0	28.3		ug/L		71	40 - 122
2,4-Dimethylphenol	20.0	14.5		ug/L		73	38 - 120
Fluorene	20.0	15.5		ug/L		78	56 - 120
Di-n-octyl phthalate	20.0	16.9		ug/L		85	21 - 122
Carbazole	20.0	16.6		ug/L		83	57 - 120
Benzyl alcohol	20.0	13.0		ug/L		65	23 - 110
Benzo[a]pyrene	20.0	17.1		ug/L		86	24 - 120
3 & 4 Methylphenol	20.0	11.5		ug/L		58	34 - 120
4-Nitroaniline	20.0	16.8		ug/L		84	48 - 120
Aniline	20.0	13.5		ug/L		68	10 - 123
Bis(2-chloroethoxy)methane	20.0	15.3		ug/L		77	48 - 120
N-Nitrosodiphenylamine	40.0	32.0		ug/L		80	51 - 120
Acenaphthylene	20.0	15.4		ug/L		77	55 - 120
2-Chlorophenol	20.0	14.6		ug/L		73	43 - 120
4-Bromophenyl phenyl ether	20.0	16.2		ug/L		81	47 - 120
2-Nitroaniline	20.0	18.1		ug/L		90	48 - 127
Pentachlorophenol	40.0	23.7		ug/L		59	14 - 120
Dibenzofuran	20.0	16.1		ug/L		81	56 - 120
Hexachlorocyclopentadiene	20.0	8.39	J	ug/L		42	4 - 120
Benzo[a]anthracene	20.0	15.7		ug/L		79	46 - 120
Chrysene	20.0	16.2		ug/L		81	49 - 120
4,6-Dinitro-2-methylphenol	40.0	21.6		ug/L		54	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	14.6		ug/L		73	40 - 160
4-Chloroaniline	20.0	15.2		ug/L		76	15 - 120
2,4-Dinitrotoluene	20.0	17.4		ug/L		87	52 - 120
1-Methylnaphthalene	20.0	16.3		ug/L		81	54 - 110

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-161139/17-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161139

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[k]fluoranthene	20.0	16.9		ug/L		84	30 - 120
Azobenzene	20.0	22.2		ug/L		111	50 - 150
Atrazine	40.0	33.0		ug/L		83	65 - 161
Benzo[g,h,i]perylene	20.0	14.4		ug/L		72	24 - 126
2,4-Dichlorophenol	20.0	16.0		ug/L		80	46 - 120
Phenanthrene	20.0	15.7		ug/L		79	57 - 120
Caprolactam	40.0	10.6		ug/L		26	10 - 120
3-Nitroaniline	20.0	16.7		ug/L		84	52 - 120
Fluoranthene	20.0	17.1		ug/L		86	57 - 120
1,1'-Biphenyl	20.0	15.2		ug/L		76	52 - 120
Benzo[b]fluoranthene	20.0	17.7		ug/L		88	24 - 120
2-Methylphenol	20.0	12.4		ug/L		62	38 - 120
N-Nitrosodi-n-propylamine	20.0	15.1		ug/L		75	48 - 123
Pyrene	20.0	16.8		ug/L		84	50 - 120
Benzoic acid	40.0	ND		ug/L		17	10 - 110
2-Methylnaphthalene	20.0	16.4		ug/L		82	52 - 120
Hexachlorobenzene	20.0	15.9		ug/L		80	52 - 120
Acenaphthene	20.0	15.6		ug/L		78	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	14.5		ug/L		73	42 - 120
Phenyl ether	20.0	16.7		ug/L		83	40 - 160
2,3,4,6-Tetrachlorophenol	20.0	14.9		ug/L		75	50 - 150
4-Chloro-3-methylphenol	20.0	15.7		ug/L		78	45 - 120
4-Chlorophenyl phenyl ether	20.0	16.0		ug/L		80	47 - 120
Bis(2-ethylhexyl) phthalate	20.0	17.2		ug/L		86	21 - 125
Butyl benzyl phthalate	20.0	16.9		ug/L		85	51 - 120
Di-n-butyl phthalate	20.0	16.8		ug/L		84	57 - 122
Isophorone	20.0	14.9		ug/L		75	48 - 123
Phenol	20.0	5.95		ug/L		30	16 - 120
2,6-Dinitrotoluene	20.0	16.9		ug/L		84	52 - 120
Diethyl phthalate	20.0	16.6		ug/L		83	58 - 120
Indeno[1,2,3-cd]pyrene	20.0	15.5		ug/L		77	25 - 120
2,4,6-Trichlorophenol	20.0	15.4		ug/L		77	43 - 120
2,4,5-Trichlorophenol	20.0	15.5		ug/L		78	47 - 120
Nitrobenzene	20.0	14.4		ug/L		72	41 - 120
Anthracene	20.0	16.0		ug/L		80	56 - 120
Bis(2-chloroethyl)ether	20.0	14.9		ug/L		74	43 - 120
2-Chloronaphthalene	20.0	15.2		ug/L		76	47 - 120
2,4-Dinitrophenol	40.0	10.8		ug/L		27	10 - 120
4-Nitrophenol	40.0	12.6		ug/L		31	16 - 120
Acetophenone	20.0	15.5		ug/L		78	50 - 120
1,2-Dichlorobenzene	20.0	14.7		ug/L		73	52 - 110
3,3'-Dichlorobenzidine	40.0	33.0		ug/L		82	29 - 120
Hexachloroethane	20.0	13.6		ug/L		68	42 - 120
Dimethyl phthalate	20.0	16.5		ug/L		83	59 - 120
Benzophenone	20.0	22.3		ug/L		112	10 - 160

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*90*		*31 - 115*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-161139/17-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161139

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*81*		*29 - 110*
2,4,6-Tribromophenol	*94*		*21 - 128*
Nitrobenzene-d5	*79*		*31 - 110*
Phenol-d5	*31*		*10 - 110*
2-Fluorophenol	*47*		*15 - 110*

Lab Sample ID: LCSD 240-161139/18-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161139

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene			20.0	14.6		ug/L		73	24 - 125	4	30
2-Nitrophenol			20.0	16.4		ug/L		82	42 - 120	0	30
Benzaldehyde			40.0	28.0		ug/L		70	40 - 122	1	30
2,4-Dimethylphenol			20.0	13.8		ug/L		69	38 - 120	5	30
Fluorene			20.0	15.1		ug/L		75	56 - 120	3	30
Di-n-octyl phthalate			20.0	15.9		ug/L		79	21 - 122	6	30
Carbazole			20.0	15.6		ug/L		78	57 - 120	6	30
Benzyl alcohol			20.0	13.2		ug/L		66	23 - 110	2	30
Benzo[a]pyrene			20.0	16.1		ug/L		81	24 - 120	6	30
3 & 4 Methylphenol			20.0	11.9		ug/L		59	34 - 120	3	30
4-Nitroaniline			20.0	16.8		ug/L		84	48 - 120	0	30
Aniline			20.0	13.5		ug/L		67	10 - 123	0	30
Bis(2-chloroethoxy)methane			20.0	15.0		ug/L		75	48 - 120	2	30
N-Nitrosodiphenylamine			40.0	30.1		ug/L		75	51 - 120	6	30
Acenaphthylene			20.0	15.0		ug/L		75	55 - 120	2	30
2-Chlorophenol			20.0	14.8		ug/L		74	43 - 120	1	30
4-Bromophenyl phenyl ether			20.0	15.3		ug/L		76	47 - 120	6	30
2-Nitroaniline			20.0	17.4		ug/L		87	48 - 127	4	30
Pentachlorophenol			40.0	24.5		ug/L		61	14 - 120	4	30
Dibenzofuran			20.0	15.6		ug/L		78	56 - 120	3	30
Hexachlorocyclopentadiene			20.0	8.53	J	ug/L		43	4 - 120	2	30
Benzo[a]anthracene			20.0	14.7		ug/L		74	46 - 120	6	30
Chrysene			20.0	15.2		ug/L		76	49 - 120	7	30
4,6-Dinitro-2-methylphenol			40.0	22.0		ug/L		55	33 - 120	2	30
1,2,4,5-Tetrachlorobenzene			20.0	14.4		ug/L		72	40 - 160	1	30
4-Chloroaniline			20.0	15.0		ug/L		75	15 - 120	1	30
2,4-Dinitrotoluene			20.0	17.0		ug/L		85	52 - 120	2	30
1-Methylnaphthalene			20.0	15.7		ug/L		79	54 - 110	3	30
Benzo[k]fluoranthene			20.0	15.6		ug/L		78	30 - 120	8	30
Azobenzene			20.0	20.8		ug/L		104	50 - 150	6	30
Atrazine			40.0	30.7		ug/L		77	65 - 161	7	30
Benzo[g,h,i]perylene			20.0	14.2		ug/L		71	24 - 126	1	30
2,4-Dichlorophenol			20.0	15.8		ug/L		79	46 - 120	1	30
Phenanthrene			20.0	14.8		ug/L		74	57 - 120	6	30
Caprolactam			40.0	9.57		ug/L		24	10 - 120	10	30
3-Nitroaniline			20.0	16.1		ug/L		81	52 - 120	3	30
Fluoranthene			20.0	16.0		ug/L		80	57 - 120	7	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-161139/18-A
Matrix: Water
Analysis Batch: 161554

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161139

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1'-Biphenyl			20.0	14.8		ug/L		74	52 - 120	2	30
Benzo[b]fluoranthene			20.0	16.5		ug/L		83	24 - 120	7	30
2-Methylphenol			20.0	12.7		ug/L		63	38 - 120	2	30
N-Nitrosodi-n-propylamine			20.0	14.7		ug/L		73	48 - 123	3	30
Pyrene			20.0	15.6		ug/L		78	50 - 120	7	30
Benzoic acid			40.0	ND		ug/L		20	10 - 110	13	30
2-Methylnaphthalene			20.0	15.6		ug/L		78	52 - 120	5	30
Hexachlorobenzene			20.0	15.0		ug/L		75	52 - 120	6	30
Acenaphthene			20.0	15.2		ug/L		76	55 - 120	3	30
2,2'-oxybis[1-chloropropane]			20.0	14.3		ug/L		71	42 - 120	2	30
Phenyl ether			20.0	16.3		ug/L		82	40 - 160	2	30
2,3,4,6-Tetrachlorophenol			20.0	14.7		ug/L		74	50 - 150	1	30
4-Chloro-3-methylphenol			20.0	15.3		ug/L		77	45 - 120	2	30
4-Chlorophenyl phenyl ether			20.0	15.7		ug/L		78	47 - 120	2	30
Bis(2-ethylhexyl) phthalate			20.0	16.1		ug/L		80	21 - 125	7	30
Butyl benzyl phthalate			20.0	15.9		ug/L		79	51 - 120	6	30
Di-n-butyl phthalate			20.0	15.7		ug/L		78	57 - 122	7	30
Isophorone			20.0	14.3		ug/L		72	48 - 123	4	30
Phenol			20.0	6.08		ug/L		30	16 - 120	2	30
2,6-Dinitrotoluene			20.0	16.6		ug/L		83	52 - 120	2	30
Diethyl phthalate			20.0	16.1		ug/L		80	58 - 120	3	30
Indeno[1,2,3-cd]pyrene			20.0	15.1		ug/L		76	25 - 120	2	30
2,4,6-Trichlorophenol			20.0	15.4		ug/L		77	43 - 120	0	30
2,4,5-Trichlorophenol			20.0	15.0		ug/L		75	47 - 120	3	30
Nitrobenzene			20.0	14.4		ug/L		72	41 - 120	1	30
Anthracene			20.0	15.1		ug/L		76	56 - 120	5	30
Bis(2-chloroethyl)ether			20.0	14.9		ug/L		74	43 - 120	0	30
2-Chloronaphthalene			20.0	14.9		ug/L		74	47 - 120	2	30
2,4-Dinitrophenol			40.0	13.4		ug/L		34	10 - 120	22	30
4-Nitrophenol			40.0	13.1		ug/L		33	16 - 120	4	30
Acetophenone			20.0	15.0		ug/L		75	50 - 120	3	30
1,2-Dichlorobenzene			20.0	14.4		ug/L		72	52 - 110	2	30
3,3'-Dichlorobenzidine			40.0	31.7		ug/L		79	29 - 120	4	30
Hexachloroethane			20.0	13.3		ug/L		67	42 - 120	2	30
Dimethyl phthalate			20.0	16.0		ug/L		80	59 - 120	3	30
Benzophenone			20.0	21.7		ug/L		108	10 - 160	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*83*		*31 - 115*
2-Fluorobiphenyl (Surr)	*78*		*29 - 110*
2,4,6-Tribromophenol	*93*		*21 - 128*
Nitrobenzene-d5	*77*		*31 - 110*
Phenol-d5	*31*		*10 - 110*
2-Fluorophenol	*48*		*15 - 110*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-161776/11-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161776

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Nitrophenol	ND		2.0	0.28	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzaldehyde	ND		1.0	0.39	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		12/19/14 07:04	12/20/14 10:45	1
Fluorene	ND		0.20	0.041	ug/L		12/19/14 07:04	12/20/14 10:45	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		12/19/14 07:04	12/20/14 10:45	1
Carbazole	ND		1.0	0.28	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzyl alcohol	ND		5.0	0.38	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		12/19/14 07:04	12/20/14 10:45	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Nitroaniline	ND		2.0	0.22	ug/L		12/19/14 07:04	12/20/14 10:45	1
Aniline	ND		5.0	0.34	ug/L		12/19/14 07:04	12/20/14 10:45	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		12/19/14 07:04	12/20/14 10:45	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		12/19/14 07:04	12/20/14 10:45	1
Acenaphthylene	ND		0.20	0.048	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Chlorophenol	ND		1.0	0.29	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Nitroaniline	ND		2.0	0.21	ug/L		12/19/14 07:04	12/20/14 10:45	1
Pentachlorophenol	ND		5.0	0.27	ug/L		12/19/14 07:04	12/20/14 10:45	1
Dibenzofuran	ND		1.0	0.020	ug/L		12/19/14 07:04	12/20/14 10:45	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzo[a]anthracene	ND		0.20	0.030	ug/L		12/19/14 07:04	12/20/14 10:45	1
Chrysene	ND		0.20	0.050	ug/L		12/19/14 07:04	12/20/14 10:45	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		12/19/14 07:04	12/20/14 10:45	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Chloroaniline	ND		2.0	0.21	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		12/19/14 07:04	12/20/14 10:45	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		12/19/14 07:04	12/20/14 10:45	1
Azobenzene	ND		10	0.29	ug/L		12/19/14 07:04	12/20/14 10:45	1
Atrazine	ND		1.0	0.34	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		12/19/14 07:04	12/20/14 10:45	1
Phenanthrene	ND		0.20	0.062	ug/L		12/19/14 07:04	12/20/14 10:45	1
Caprolactam	ND		5.0	0.20	ug/L		12/19/14 07:04	12/20/14 10:45	1
3-Nitroaniline	ND		2.0	0.28	ug/L		12/19/14 07:04	12/20/14 10:45	1
Fluoranthene	ND		0.20	0.045	ug/L		12/19/14 07:04	12/20/14 10:45	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Methylphenol	ND		1.0	0.17	ug/L		12/19/14 07:04	12/20/14 10:45	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		12/19/14 07:04	12/20/14 10:45	1
Pyrene	ND		0.20	0.042	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzoic acid	ND		25	10	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		12/19/14 07:04	12/20/14 10:45	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		12/19/14 07:04	12/20/14 10:45	1
Acenaphthene	ND		0.20	0.044	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		12/19/14 07:04	12/20/14 10:45	1
Phenyl ether	ND		10	1.2	ug/L		12/19/14 07:04	12/20/14 10:45	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-161776/11-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161776

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		12/19/14 07:04	12/20/14 10:45	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		12/19/14 07:04	12/20/14 10:45	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		12/19/14 07:04	12/20/14 10:45	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		12/19/14 07:04	12/20/14 10:45	1
Isophorone	ND		1.0	0.27	ug/L		12/19/14 07:04	12/20/14 10:45	1
Phenol	ND		1.0	0.60	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		12/19/14 07:04	12/20/14 10:45	1
Diethyl phthalate	ND		2.0	0.60	ug/L		12/19/14 07:04	12/20/14 10:45	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		12/19/14 07:04	12/20/14 10:45	1
Nitrobenzene	ND		1.0	0.040	ug/L		12/19/14 07:04	12/20/14 10:45	1
Anthracene	ND		0.20	0.088	ug/L		12/19/14 07:04	12/20/14 10:45	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		12/19/14 07:04	12/20/14 10:45	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		12/19/14 07:04	12/20/14 10:45	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		12/19/14 07:04	12/20/14 10:45	1
4-Nitrophenol	ND		5.0	0.29	ug/L		12/19/14 07:04	12/20/14 10:45	1
Acetophenone	ND		1.0	0.34	ug/L		12/19/14 07:04	12/20/14 10:45	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		12/19/14 07:04	12/20/14 10:45	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		12/19/14 07:04	12/20/14 10:45	1
Hexachloroethane	ND		1.0	0.19	ug/L		12/19/14 07:04	12/20/14 10:45	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		12/19/14 07:04	12/20/14 10:45	1
Benzophenone	ND		5.0	5.0	ug/L		12/19/14 07:04	12/20/14 10:45	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*12/19/14 07:04*	*12/20/14 10:45*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*83*		*31 - 115*	*12/19/14 07:04*	*12/20/14 10:45*	*1*
2-Fluorobiphenyl (Surr)	*67*		*29 - 110*	*12/19/14 07:04*	*12/20/14 10:45*	*1*
2,4,6-Tribromophenol	*57*		*21 - 128*	*12/19/14 07:04*	*12/20/14 10:45*	*1*
Nitrobenzene-d5	*60*		*31 - 110*	*12/19/14 07:04*	*12/20/14 10:45*	*1*
Phenol-d5	*32*		*10 - 110*	*12/19/14 07:04*	*12/20/14 10:45*	*1*
2-Fluorophenol	*47*		*15 - 110*	*12/19/14 07:04*	*12/20/14 10:45*	*1*

Lab Sample ID: LCS 240-161776/12-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161776

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	15.4		ug/L		77	24 - 125
2-Nitrophenol	20.0	15.4		ug/L		77	42 - 120
Benzaldehyde	40.0	25.1		ug/L		63	40 - 122
2,4-Dimethylphenol	20.0	14.5		ug/L		72	38 - 120
Fluorene	20.0	14.7		ug/L		74	56 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-161776/12-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161776

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Di-n-octyl phthalate	20.0	15.3		ug/L		76	21 - 122
Carbazole	20.0	15.2		ug/L		76	57 - 120
Benzyl alcohol	20.0	12.6		ug/L		63	23 - 110
Benzo[a]pyrene	20.0	16.1		ug/L		80	24 - 120
3 & 4 Methylphenol	20.0	11.6		ug/L		58	34 - 120
4-Nitroaniline	20.0	15.8		ug/L		79	48 - 120
Aniline	20.0	12.4		ug/L		62	10 - 123
Bis(2-chloroethoxy)methane	20.0	14.0		ug/L		70	48 - 120
N-Nitrosodiphenylamine	40.0	29.5		ug/L		74	51 - 120
Acenaphthylene	20.0	14.3		ug/L		72	55 - 120
2-Chlorophenol	20.0	13.5		ug/L		68	43 - 120
4-Bromophenyl phenyl ether	20.0	14.8		ug/L		74	47 - 120
2-Nitroaniline	20.0	16.1		ug/L		80	48 - 127
Pentachlorophenol	40.0	23.9		ug/L		60	14 - 120
Dibenzofuran	20.0	15.2		ug/L		76	56 - 120
Hexachlorocyclopentadiene	20.0	8.02	J	ug/L		40	4 - 120
Benzo[a]anthracene	20.0	14.5		ug/L		73	46 - 120
Chrysene	20.0	15.3		ug/L		76	49 - 120
4,6-Dinitro-2-methylphenol	40.0	19.8		ug/L		50	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	14.0		ug/L		70	40 - 160
4-Chloroaniline	20.0	14.6		ug/L		73	15 - 120
2,4-Dinitrotoluene	20.0	15.9		ug/L		79	52 - 120
1-Methylnaphthalene	20.0	15.4		ug/L		77	54 - 110
Benzo[k]fluoranthene	20.0	16.6		ug/L		83	30 - 120
Azobenzene	20.0	19.6		ug/L		98	50 - 150
Atrazine	40.0	30.1		ug/L		75	65 - 161
Benzo[g,h,i]perylene	20.0	14.7		ug/L		73	24 - 126
2,4-Dichlorophenol	20.0	15.4		ug/L		77	46 - 120
Phenanthrene	20.0	14.6		ug/L		73	57 - 120
Caprolactam	40.0	11.2		ug/L		28	10 - 120
3-Nitroaniline	20.0	15.4		ug/L		77	52 - 120
Fluoranthene	20.0	15.7		ug/L		79	57 - 120
1,1'-Biphenyl	20.0	14.5		ug/L		72	52 - 120
Benzo[b]fluoranthene	20.0	15.1		ug/L		75	24 - 120
2-Methylphenol	20.0	12.1		ug/L		61	38 - 120
N-Nitrosodi-n-propylamine	20.0	13.1		ug/L		65	48 - 123
Pyrene	20.0	15.6		ug/L		78	50 - 120
Benzoic acid	40.0	ND		ug/L		19	10 - 110
2-Methylnaphthalene	20.0	15.3		ug/L		77	52 - 120
Hexachlorobenzene	20.0	14.5		ug/L		72	52 - 120
Acenaphthene	20.0	14.7		ug/L		73	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	12.3		ug/L		62	42 - 120
Phenyl ether	20.0	15.9		ug/L		80	40 - 160
2,3,4,6-Tetrachlorophenol	20.0	13.6		ug/L		68	50 - 150
4-Chloro-3-methylphenol	20.0	14.9		ug/L		74	45 - 120
4-Chlorophenyl phenyl ether	20.0	15.2		ug/L		76	47 - 120
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		78	21 - 125
Butyl benzyl phthalate	20.0	14.8		ug/L		74	51 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-161776/12-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161776

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Di-n-butyl phthalate			20.0	14.7		ug/L		74	57 - 122		
Isophorone			20.0	13.4		ug/L		67	48 - 123		
Phenol			20.0	6.48		ug/L		32	16 - 120		
2,6-Dinitrotoluene			20.0	16.0		ug/L		80	52 - 120		
Diethyl phthalate			20.0	15.5		ug/L		77	58 - 120		
Indeno[1,2,3-cd]pyrene			20.0	15.5		ug/L		78	25 - 120		
2,4,6-Trichlorophenol			20.0	14.8		ug/L		74	43 - 120		
2,4,5-Trichlorophenol			20.0	14.2		ug/L		71	47 - 120		
Nitrobenzene			20.0	13.2		ug/L		66	41 - 120		
Anthracene			20.0	14.9		ug/L		74	56 - 120		
Bis(2-chloroethyl)ether			20.0	13.1		ug/L		66	43 - 120		
2-Chloronaphthalene			20.0	14.3		ug/L		71	47 - 120		
2,4-Dinitrophenol			40.0	12.0		ug/L		30	10 - 120		
4-Nitrophenol			40.0	14.8		ug/L		37	16 - 120		
Acetophenone			20.0	13.8		ug/L		69	50 - 120		
1,2-Dichlorobenzene			20.0	13.5		ug/L		67	52 - 110		
3,3'-Dichlorobenzidine			40.0	29.1		ug/L		73	29 - 120		
Hexachloroethane			20.0	12.5		ug/L		62	42 - 120		
Dimethyl phthalate			20.0	15.6		ug/L		78	59 - 120		
Benzophenone			20.0	20.1		ug/L		101	10 - 160		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*84*		*31 - 115*
2-Fluorobiphenyl (Surr)	*75*		*29 - 110*
2,4,6-Tribromophenol	*85*		*21 - 128*
Nitrobenzene-d5	*71*		*31 - 110*
Phenol-d5	*34*		*10 - 110*
2-Fluorophenol	*50*		*15 - 110*

Lab Sample ID: LCSD 240-161776/13-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161776

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene			20.0	15.5		ug/L		78	24 - 125	1	30
2-Nitrophenol			20.0	15.7		ug/L		78	42 - 120	2	30
Benzaldehyde			40.0	25.7		ug/L		64	40 - 122	3	30
2,4-Dimethylphenol			20.0	14.7		ug/L		73	38 - 120	1	30
Fluorene			20.0	14.8		ug/L		74	56 - 120	1	30
Di-n-octyl phthalate			20.0	15.6		ug/L		78	21 - 122	2	30
Carbazole			20.0	15.5		ug/L		77	57 - 120	2	30
Benzyl alcohol			20.0	12.7		ug/L		63	23 - 110	1	30
Benzo[a]pyrene			20.0	16.2		ug/L		81	24 - 120	1	30
3 & 4 Methylphenol			20.0	11.5		ug/L		58	34 - 120	0	30
4-Nitroaniline			20.0	15.9		ug/L		80	48 - 120	1	30
Aniline			20.0	12.7		ug/L		63	10 - 123	2	30
Bis(2-chloroethoxy)methane			20.0	14.2		ug/L		71	48 - 120	2	30
N-Nitrosodiphenylamine			40.0	30.0		ug/L		75	51 - 120	2	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-161776/13-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161776

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthylene	20.0	14.4		ug/L		72	55 - 120	1	30
2-Chlorophenol	20.0	14.1		ug/L		70	43 - 120	4	30
4-Bromophenyl phenyl ether	20.0	15.3		ug/L		77	47 - 120	4	30
2-Nitroaniline	20.0	16.2		ug/L		81	48 - 127	1	30
Pentachlorophenol	40.0	24.5		ug/L		61	14 - 120	2	30
Dibenzofuran	20.0	15.3		ug/L		77	56 - 120	1	30
Hexachlorocyclopentadiene	20.0	7.93	J	ug/L		40	4 - 120	1	30
Benzo[a]anthracene	20.0	14.6		ug/L		73	46 - 120	0	30
Chrysene	20.0	15.3		ug/L		76	49 - 120	0	30
4,6-Dinitro-2-methylphenol	40.0	20.4		ug/L		51	33 - 120	3	30
1,2,4,5-Tetrachlorobenzene	20.0	14.3		ug/L		71	40 - 160	2	30
4-Chloroaniline	20.0	15.0		ug/L		75	15 - 120	2	30
2,4-Dinitrotoluene	20.0	16.5		ug/L		82	52 - 120	4	30
1-Methylnaphthalene	20.0	15.6		ug/L		78	54 - 110	1	30
Benzo[k]fluoranthene	20.0	16.8		ug/L		84	30 - 120	1	30
Azobenzene	20.0	19.7		ug/L		98	50 - 150	1	30
Atrazine	40.0	30.3		ug/L		76	65 - 161	1	30
Benzo[g,h,i]perylene	20.0	15.3		ug/L		77	24 - 126	4	30
2,4-Dichlorophenol	20.0	15.9		ug/L		79	46 - 120	3	30
Phenanthrene	20.0	14.7		ug/L		73	57 - 120	0	30
Caprolactam	40.0	9.79		ug/L		24	10 - 120	14	30
3-Nitroaniline	20.0	15.8		ug/L		79	52 - 120	3	30
Fluoranthene	20.0	15.9		ug/L		80	57 - 120	1	30
1,1'-Biphenyl	20.0	14.5		ug/L		73	52 - 120	0	30
Benzo[b]fluoranthene	20.0	15.4		ug/L		77	24 - 120	2	30
2-Methylphenol	20.0	12.3		ug/L		62	38 - 120	2	30
N-Nitrosodi-n-propylamine	20.0	13.5		ug/L		68	48 - 123	3	30
Pyrene	20.0	15.6		ug/L		78	50 - 120	0	30
Benzoic acid	40.0	ND		ug/L		19	10 - 110	1	30
2-Methylnaphthalene	20.0	15.6		ug/L		78	52 - 120	2	30
Hexachlorobenzene	20.0	14.9		ug/L		75	52 - 120	3	30
Acenaphthene	20.0	15.0		ug/L		75	55 - 120	2	30
2,2'-oxybis[1-chloropropane]	20.0	12.7		ug/L		63	42 - 120	2	30
Phenyl ether	20.0	16.2		ug/L		81	40 - 160	1	30
2,3,4,6-Tetrachlorophenol	20.0	14.0		ug/L		70	50 - 150	3	30
4-Chloro-3-methylphenol	20.0	14.8		ug/L		74	45 - 120	0	30
4-Chlorophenyl phenyl ether	20.0	15.4		ug/L		77	47 - 120	1	30
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		78	21 - 125	0	30
Butyl benzyl phthalate	20.0	15.1		ug/L		75	51 - 120	2	30
Di-n-butyl phthalate	20.0	15.2		ug/L		76	57 - 122	3	30
Isophorone	20.0	13.5		ug/L		68	48 - 123	1	30
Phenol	20.0	6.36		ug/L		32	16 - 120	2	30
2,6-Dinitrotoluene	20.0	16.2		ug/L		81	52 - 120	1	30
Diethyl phthalate	20.0	15.7		ug/L		78	58 - 120	1	30
Indeno[1,2,3-cd]pyrene	20.0	16.0		ug/L		80	25 - 120	3	30
2,4,6-Trichlorophenol	20.0	15.1		ug/L		76	43 - 120	2	30
2,4,5-Trichlorophenol	20.0	14.8		ug/L		74	47 - 120	4	30
Nitrobenzene	20.0	13.6		ug/L		68	41 - 120	3	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-161776/13-A
Matrix: Water
Analysis Batch: 161956

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161776

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Anthracene	20.0	15.0		ug/L		75	56 - 120	1	30
Bis(2-chloroethyl)ether	20.0	13.6		ug/L		68	43 - 120	4	30
2-Chloronaphthalene	20.0	14.4		ug/L		72	47 - 120	1	30
2,4-Dinitrophenol	40.0	12.8		ug/L		32	10 - 120	6	30
4-Nitrophenol	40.0	13.4		ug/L		34	16 - 120	10	30
Acetophenone	20.0	14.3		ug/L		71	50 - 120	3	30
1,2-Dichlorobenzene	20.0	13.8		ug/L		69	52 - 110	2	30
3,3'-Dichlorobenzidine	40.0	30.1		ug/L		75	29 - 120	3	30
Hexachloroethane	20.0	12.8		ug/L		64	42 - 120	3	30
Dimethyl phthalate	20.0	15.7		ug/L		78	59 - 120	1	30
Benzophenone	20.0	20.4		ug/L		102	10 - 160	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*84*		*31 - 115*
2-Fluorobiphenyl (Surr)	*75*		*29 - 110*
2,4,6-Tribromophenol	*87*		*21 - 128*
Nitrobenzene-d5	*72*		*31 - 110*
Phenol-d5	*32*		*10 - 110*
2-Fluorophenol	*49*		*15 - 110*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Lab Sample ID: MB 320-60679/1-A
Matrix: Water
Analysis Batch: 61465

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 60679

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		12/15/14 10:45	12/23/14 18:17	1
N-Nitrosodimethylamine	0.938	J	2.0	0.39	ng/L		12/15/14 10:45	12/23/14 18:17	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*42*		*25 - 150*	*12/15/14 10:45*	*12/23/14 18:17*	*1*
N-Nitrosodi-n-propylamine-d14	*75*		*25 - 150*	*12/15/14 10:45*	*12/23/14 18:17*	*1*

Lab Sample ID: LCS 320-60679/2-A
Matrix: Water
Analysis Batch: 61465

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 60679

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodi-n-propylamine	20.0	21.8		ng/L		109	53 - 166
N-Nitrosodimethylamine	20.0	22.1		ng/L		110	58 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*
N-Nitrosodi-n-propylamine-d14	*83*		*25 - 150*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS (Continued)

Lab Sample ID: MB 320-61026/1-A
Matrix: Water
Analysis Batch: 61432

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 61026

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		12/18/14 10:29	12/20/14 04:21	1
N-Nitrosodimethylamine	ND		2.0	0.39	ng/L		12/18/14 10:29	12/20/14 04:21	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*47*		*25 - 150*	*12/18/14 10:29*	*12/20/14 04:21*	*1*
N-Nitrosodi-n-propylamine-d14	*90*		*25 - 150*	*12/18/14 10:29*	*12/20/14 04:21*	*1*

Lab Sample ID: LCS 320-61026/2-A
Matrix: Water
Analysis Batch: 61432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 61026

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodi-n-propylamine	20.0	27.1		ng/L		136	53 - 166
N-Nitrosodimethylamine	20.0	20.3		ng/L		101	58 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
N-Nitrosodimethylamine-d6	*50*		*25 - 150*
N-Nitrosodi-n-propylamine-d14	*87*		*25 - 150*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 680-362702/2
Matrix: Water
Analysis Batch: 362702

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.050	0.023	mg/L			12/11/14 08:33	1
Nitrite as N	ND		0.050	0.023	mg/L			12/11/14 08:33	1

Lab Sample ID: LCS 680-362702/3
Matrix: Water
Analysis Batch: 362702

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.999	1.03		mg/L		103	90 - 110
Nitrite as N	0.997	0.990		mg/L		99	90 - 110

Lab Sample ID: LCSD 680-362702/4
Matrix: Water
Analysis Batch: 362702

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.999	1.03		mg/L		103	90 - 110	0	30
Nitrite as N	0.997	0.994		mg/L		100	90 - 110	0	30

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 680-363655/2
Matrix: Water
Analysis Batch: 363655

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			12/17/14 10:46	1
Sulfate	ND		1.0	0.40	mg/L			12/17/14 10:46	1

Lab Sample ID: LCS 680-363655/3
Matrix: Water
Analysis Batch: 363655

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			10.0	9.96		mg/L		100	90 - 110		
Sulfate			10.0	10.6		mg/L		106	90 - 110		

Lab Sample ID: LCSD 680-363655/4
Matrix: Water
Analysis Batch: 363655

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			10.0	9.97		mg/L		100	90 - 110	0	30
Sulfate			10.0	10.6		mg/L		106	90 - 110	0	30

Lab Sample ID: 240-45265-6 MS
Matrix: Water
Analysis Batch: 363655

Client Sample ID: OC-M14L2B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	15		10.0	24.6		mg/L		101	80 - 120		
Sulfate	52		10.0	61.9	E 4	mg/L		97	80 - 120		

Lab Sample ID: 240-45265-6 MSD
Matrix: Water
Analysis Batch: 363655

Client Sample ID: OC-M14L2B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	15		10.0	24.6		mg/L		101	80 - 120	0	30
Sulfate	52		10.0	61.9	E 4	mg/L		96	80 - 120	0	30

Lab Sample ID: 240-45331-2 MS
Matrix: Water
Analysis Batch: 363655

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	28		10.0	38.4		mg/L		100	80 - 120		
Sulfate	18		10.0	27.7		mg/L		101	80 - 120		

Lab Sample ID: 240-45331-2 MSD
Matrix: Water
Analysis Batch: 363655

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	28		10.0	38.6		mg/L		102	80 - 120	0	30

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 240-45331-2 MSD — **Client Sample ID: OC-M02L07**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 363655

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	18		10.0	27.8		mg/L		103	80 - 120	0	30

Lab Sample ID: MB 680-363831/37 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 363831

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			12/17/14 20:02	1

Lab Sample ID: LCS 680-363831/39 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 363831

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.1		mg/L		101	90 - 110

Lab Sample ID: LCSD 680-363831/40 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 363831

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.1		mg/L		101	90 - 110	0	30

Lab Sample ID: MB 680-364042/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 364042

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			12/19/14 07:24	1

Lab Sample ID: LCS 680-364042/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 364042

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.92		mg/L		99	90 - 110

Lab Sample ID: LCSD 680-364042/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 364042

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.94		mg/L		99	90 - 110	0	30

Lab Sample ID: MB 680-364332/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 364332

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.0	0.40	mg/L			12/20/14 12:24	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 680-364332/3
Matrix: Water
Analysis Batch: 364332

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.98		mg/L		100	90 - 110

Lab Sample ID: LCSD 680-364332/4
Matrix: Water
Analysis Batch: 364332

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	9.99		mg/L		100	90 - 110	0	30

Lab Sample ID: MB 680-365005/2
Matrix: Water
Analysis Batch: 365005

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			12/24/14 09:32	1

Lab Sample ID: LCS 680-365005/3
Matrix: Water
Analysis Batch: 365005

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.0		mg/L		100	90 - 110

Lab Sample ID: LCSD 680-365005/4
Matrix: Water
Analysis Batch: 365005

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.1		mg/L		101	90 - 110	0	30

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 240-160733/1-A
Matrix: Water
Analysis Batch: 161114

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 160733

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/12/14 09:47	12/15/14 09:42	1
Sodium	374	J	5000	180	ug/L		12/12/14 09:47	12/15/14 09:42	1

Lab Sample ID: LCS 240-160733/2-A
Matrix: Water
Analysis Batch: 161114

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 160733

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	176		ug/L		88	80 - 120
Sodium	50000	47300		ug/L		95	80 - 120

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 240-160733/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161114 — **Prep Batch: 160733**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	181		ug/L		90	80 - 120	2	20
Sodium	50000	46600		ug/L		93	80 - 120	1	20

Lab Sample ID: 240-45265-6 MS — **Client Sample ID: OC-M14L2B**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161114 — **Prep Batch: 160733**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	ND		200	194		ug/L		97	75 - 125
Sodium	25000	B	50000	73700		ug/L		98	75 - 125

Lab Sample ID: 240-45265-6 MSD — **Client Sample ID: OC-M14L2B**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161114 — **Prep Batch: 160733**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	ND		200	191		ug/L		96	75 - 125	2	20
Sodium	25000	B	50000	72000		ug/L		95	75 - 125	2	20

Lab Sample ID: MB 240-161420/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161791 — **Prep Batch: 161420**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		12/17/14 09:57	12/18/14 13:34	1
Sodium	ND		5000	180	ug/L		12/17/14 09:57	12/18/14 13:34	1

Lab Sample ID: LCS 240-161420/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161791 — **Prep Batch: 161420**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	179		ug/L		89	80 - 120
Sodium	50000	45600		ug/L		91	80 - 120

Lab Sample ID: LCSD 240-161420/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161791 — **Prep Batch: 161420**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	178		ug/L		89	80 - 120	1	20
Sodium	50000	45500		ug/L		91	80 - 120	0	20

Lab Sample ID: 240-45524-2 MS — **Client Sample ID: OC-M24L54**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 161791 — **Prep Batch: 161420**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	ND		200	196		ug/L		98	75 - 125

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 240-45524-2 MS
Matrix: Water
Analysis Batch: 161791

Client Sample ID: OC-M24L54
Prep Type: Total Recoverable
Prep Batch: 161420

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	23000		50000	74200		ug/L		103	75 - 125

Lab Sample ID: 240-45524-2 MSD
Matrix: Water
Analysis Batch: 161791

Client Sample ID: OC-M24L54
Prep Type: Total Recoverable
Prep Batch: 161420

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	ND		200	194		ug/L		97	75 - 125	1	20
Sodium	23000		50000	73700		ug/L		102	75 - 125	1	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 680-364133/1-A
Matrix: Water
Analysis Batch: 364360

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 364133

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.050	0.026	mg/L		12/19/14 11:27	12/19/14 14:53	1

Lab Sample ID: LCS 680-364133/2-A
Matrix: Water
Analysis Batch: 364360

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 364133

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.09		mg/L		109	90 - 110

Lab Sample ID: LCSD 680-364133/3-A
Matrix: Water
Analysis Batch: 364360

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 364133

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	1.00	1.10		mg/L		110	90 - 110	0	30

Lab Sample ID: 240-45265-6 MS
Matrix: Water
Analysis Batch: 364360

Client Sample ID: OC-M14L2B
Prep Type: Total/NA
Prep Batch: 364133

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	0.11		1.00	1.07		mg/L		97	90 - 110

Lab Sample ID: 240-45265-6 MSD
Matrix: Water
Analysis Batch: 364360

Client Sample ID: OC-M14L2B
Prep Type: Total/NA
Prep Batch: 364133

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	0.11		1.00	1.10		mg/L		100	90 - 110	3	30

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: 240-45524-2 DU
Matrix: Water
Analysis Batch: 364360

Client Sample ID: OC-M24L54
Prep Type: Total/NA
Prep Batch: 364133

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Ammonia	0.11			0.102		mg/L				8	30

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 680-362790/13
Matrix: Water
Analysis Batch: 362790

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.010	mg/L			12/11/14 10:21	1

Lab Sample ID: LCS 680-362790/16
Matrix: Water
Analysis Batch: 362790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrite as N			0.500	0.495		mg/L		99	90 - 110		

Lab Sample ID: 240-45265-7 MS
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L72A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrite as N	ND		2.50	2.46		mg/L		98	90 - 110		

Lab Sample ID: 240-45265-7 MSD
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L72A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND		2.50	2.46		mg/L		99	90 - 110	0	10

Lab Sample ID: 240-45265-12 DU
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L66
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrite as N	ND			ND		mg/L				NC	10

Lab Sample ID: MB 680-363015/13
Matrix: Water
Analysis Batch: 363015

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.010	mg/L			12/12/14 11:30	1

Method: 353.2 - Nitrogen, Nitrite (Continued)

Lab Sample ID: LCS 680-363015/16
Matrix: Water
Analysis Batch: 363015

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.500	0.499		mg/L		100	90 - 110

Lab Sample ID: 240-45331-1 MS
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	ND	H	0.500	0.475		mg/L		95	90 - 110

Lab Sample ID: 240-45331-1 MSD
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND	H	0.500	0.475		mg/L		95	90 - 110	0	10

Lab Sample ID: 240-45331-2 DU
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrite as N	ND		ND		mg/L		NC	10

Lab Sample ID: MB 680-363636/13
Matrix: Water
Analysis Batch: 363636

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.010	mg/L			12/17/14 10:25	1

Lab Sample ID: LCS 680-363636/16
Matrix: Water
Analysis Batch: 363636

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.500	0.499		mg/L		100	90 - 110

Lab Sample ID: 240-45524-2 MS
Matrix: Water
Analysis Batch: 363636

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	ND		0.500	0.479		mg/L		96	90 - 110

Lab Sample ID: 240-45524-2 MSD
Matrix: Water
Analysis Batch: 363636

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND		0.500	0.471		mg/L		94	90 - 110	2	10

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: 240-45265-7 MS
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L72A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.3		5.00	6.28		mg/L		99	90 - 110
Nitrite as N	ND		2.50	2.46		mg/L		98	90 - 110

Lab Sample ID: 240-45265-7 MSD
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L72A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	1.3		5.00	6.25		mg/L		98	90 - 110	0	10
Nitrite as N	ND		2.50	2.46		mg/L		99	90 - 110	0	10

Lab Sample ID: 240-45265-12 DU
Matrix: Water
Analysis Batch: 362790

Client Sample ID: OC-M24L66
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	ND		ND		mg/L		NC	30

Lab Sample ID: 240-45331-1 MS
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.022	J H	1.00	1.05		mg/L		102	90 - 110
Nitrite as N	ND	H	0.500	0.475		mg/L		95	90 - 110

Lab Sample ID: 240-45331-1 MSD
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.022	J H	1.00	1.05		mg/L		102	90 - 110	0	10
Nitrite as N	ND	H	0.500	0.475		mg/L		95	90 - 110	0	10

Lab Sample ID: 240-45331-2 DU
Matrix: Water
Analysis Batch: 363015

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	9.4		9.37		mg/L		0.09	30

Lab Sample ID: 240-45524-2 MS
Matrix: Water
Analysis Batch: 363636

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	ND		1.00	1.04		mg/L		104	90 - 110
Nitrite as N	ND		0.500	0.479		mg/L		96	90 - 110

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 240-45524-2 MSD — **Client Sample ID: OC-M24L54**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 363636

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	ND		1.00	1.03		mg/L		103	90 - 110	1	10
Nitrite as N	ND		0.500	0.471		mg/L		94	90 - 110	2	10

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 360-99580/9 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99580

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/10/14 10:00	1

Lab Sample ID: LCS 360-99580/10 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99580

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	0.0507	0.0492		mg/L		97	80 - 120

Lab Sample ID: LCSD 360-99580/11 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99580

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	0.0507	0.0492		mg/L		97	80 - 120	0	20

Lab Sample ID: 240-45265-6 MS — **Client Sample ID: OC-M14L2B**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99580

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	ND		0.0250	0.0230		mg/L		92	85 - 115

Lab Sample ID: 240-45265-6 MSD — **Client Sample ID: OC-M14L2B**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99580

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	ND		0.0250	0.0242		mg/L		97	85 - 115	5	20

Lab Sample ID: MB 360-99586/9 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 99586

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/11/14 10:25	1

Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: LCS 360-99586/10
Matrix: Water
Analysis Batch: 99586

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	0.0507	0.0500		mg/L		99	80 - 120

Lab Sample ID: LCSD 360-99586/11
Matrix: Water
Analysis Batch: 99586

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	0.0507	0.0500		mg/L		99	80 - 120	0	20

Lab Sample ID: 240-45331-1 MS
Matrix: Water
Analysis Batch: 99586

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	ND		0.0250	0.0231		mg/L		93	85 - 115

Lab Sample ID: 240-45331-1 MSD
Matrix: Water
Analysis Batch: 99586

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	ND		0.0250	0.0231		mg/L		93	85 - 115	0	20

Lab Sample ID: MB 360-99599/9
Matrix: Water
Analysis Batch: 99599

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			12/16/14 11:46	1

Lab Sample ID: LCS 360-99599/10
Matrix: Water
Analysis Batch: 99599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	0.0507	0.0496		mg/L		98	80 - 120

Lab Sample ID: LCSD 360-99599/11
Matrix: Water
Analysis Batch: 99599

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	0.0507	0.0496		mg/L		98	80 - 120	0	20

Lab Sample ID: 240-45524-2 MS
Matrix: Water
Analysis Batch: 99599

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	ND		0.0250	0.0219		mg/L		87	85 - 115

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Lab Sample ID: 240-45524-2 MSD
Matrix: Water
Analysis Batch: 99599

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	ND		0.0250	0.0219		mg/L		87	85 - 115	0	20

GC/MS Semi VOA

Prep Batch: 60679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-1	OC-M03L02	Total/NA	Water	3510C	
240-45265-2	OC-M03L2D	Total/NA	Water	3510C	
240-45265-3	OC-M03L2F	Total/NA	Water	3510C	
240-45265-4	OC-M03L07	Total/NA	Water	3510C	
240-45265-5	OC-M01L06	Total/NA	Water	3510C	
240-45265-6	OC-M14L2B	Total/NA	Water	3510C	
240-45265-7	OC-M24L72A	Total/NA	Water	3510C	
240-45265-8	OC-M24L65	Total/NA	Water	3510C	
240-45265-9	OC-M24L64	Total/NA	Water	3510C	
240-45265-10	OC-M24L87	Total/NA	Water	3510C	
240-45265-11	OC-M24L116	Total/NA	Water	3510C	
240-45265-12	OC-M24L66	Total/NA	Water	3510C	
240-45265-13	OC-M24L94	Total/NA	Water	3510C	
240-45265-14	OC-M24L63	Total/NA	Water	3510C	
240-45331-1	OC-M15L2C	Total/NA	Water	3510C	
240-45331-2	OC-M02L07	Total/NA	Water	3510C	
LCS 320-60679/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-60679/1-A	Method Blank	Total/NA	Water	3510C	

Prep Batch: 61026

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-1	OC-M01L6D	Total/NA	Water	3510C	
240-45524-2	OC-M24L54	Total/NA	Water	3510C	
LCS 320-61026/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-61026/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 61432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	GCMSMS_NDMA	61026
LCS 320-61026/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	61026
MB 320-61026/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	61026

Analysis Batch: 61465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-1	OC-M03L02	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-2	OC-M03L2D	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-3	OC-M03L2F	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-4	OC-M03L07	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-5	OC-M01L06	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-6	OC-M14L2B	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-7	OC-M24L72A	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-8	OC-M24L65	Total/NA	Water	GCMSMS_NDMA	60679

GC/MS Semi VOA (Continued)

Analysis Batch: 61465 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-9	OC-M24L64	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-10	OC-M24L87	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-11	OC-M24L116	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-12	OC-M24L66	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-13	OC-M24L94	Total/NA	Water	GCMSMS_NDMA	60679
240-45265-14	OC-M24L63	Total/NA	Water	GCMSMS_NDMA	60679
240-45331-1	OC-M15L2C	Total/NA	Water	GCMSMS_NDMA	60679
240-45331-2	OC-M02L07	Total/NA	Water	GCMSMS_NDMA	60679
240-45524-1	OC-M01L6D	Total/NA	Water	GCMSMS_NDMA	61026
LCS 320-60679/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	60679
MB 320-60679/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	60679

Prep Batch: 160933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-9	OC-M24L64	Total/NA	Water	3510C	
240-45265-13	OC-M24L94	Total/NA	Water	3510C	
240-45265-14	OC-M24L63	Total/NA	Water	3510C	
LCS 240-160933/5-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-160933/6-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-160933/4-A	Method Blank	Total/NA	Water	3510C	

Prep Batch: 161139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45331-1	OC-M15L2C	Total/NA	Water	3510C	
240-45331-2	OC-M02L07	Total/NA	Water	3510C	
LCS 240-161139/17-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-161139/18-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-161139/16-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 161554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-9	OC-M24L64	Total/NA	Water	8270D	160933
240-45265-13	OC-M24L94	Total/NA	Water	8270D	160933
240-45265-14	OC-M24L63	Total/NA	Water	8270D	160933
240-45331-1	OC-M15L2C	Total/NA	Water	8270D	161139
240-45331-2	OC-M02L07	Total/NA	Water	8270D	161139
LCS 240-160933/5-A	Lab Control Sample	Total/NA	Water	8270D	160933
LCS 240-161139/17-A	Lab Control Sample	Total/NA	Water	8270D	161139
LCSD 240-160933/6-A	Lab Control Sample Dup	Total/NA	Water	8270D	160933
LCSD 240-161139/18-A	Lab Control Sample Dup	Total/NA	Water	8270D	161139
MB 240-160933/4-A	Method Blank	Total/NA	Water	8270D	160933
MB 240-161139/16-A	Method Blank	Total/NA	Water	8270D	161139

GC/MS Semi VOA (Continued)

Prep Batch: 161776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	3510C	
LCS 240-161776/12-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-161776/13-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-161776/11-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 161956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	8270D	161776
LCS 240-161776/12-A	Lab Control Sample	Total/NA	Water	8270D	161776
LCSD 240-161776/13-A	Lab Control Sample Dup	Total/NA	Water	8270D	161776
MB 240-161776/11-A	Method Blank	Total/NA	Water	8270D	161776

HPLC/IC

Analysis Batch: 362702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total/NA	Water	300.0	
LCS 680-362702/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-362702/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-362702/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 363655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total/NA	Water	300.0	
240-45265-6 MS	OC-M14L2B	Total/NA	Water	300.0	
240-45265-6 MSD	OC-M14L2B	Total/NA	Water	300.0	
240-45265-7	OC-M24L72A	Total/NA	Water	300.0	
240-45265-8	OC-M24L65	Total/NA	Water	300.0	
240-45265-8	OC-M24L65	Total/NA	Water	300.0	
240-45265-9	OC-M24L64	Total/NA	Water	300.0	
240-45265-9	OC-M24L64	Total/NA	Water	300.0	
240-45265-10	OC-M24L87	Total/NA	Water	300.0	
240-45265-10	OC-M24L87	Total/NA	Water	300.0	
240-45265-12	OC-M24L66	Total/NA	Water	300.0	
240-45265-13	OC-M24L94	Total/NA	Water	300.0	
240-45265-14	OC-M24L63	Total/NA	Water	300.0	
240-45265-14	OC-M24L63	Total/NA	Water	300.0	
240-45331-1	OC-M15L2C	Total/NA	Water	300.0	
240-45331-2	OC-M02L07	Total/NA	Water	300.0	
240-45331-2 MS	OC-M02L07	Total/NA	Water	300.0	
240-45331-2 MSD	OC-M02L07	Total/NA	Water	300.0	
LCS 680-363655/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-363655/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-363655/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 363831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45331-1	OC-M15L2C	Total/NA	Water	300.0	
LCS 680-363831/39	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-363831/40	Lab Control Sample Dup	Total/NA	Water	300.0	

HPLC/IC (Continued)

Analysis Batch: 363831 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-363831/37	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 364042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-13	OC-M24L94	Total/NA	Water	300.0	
LCS 680-364042/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-364042/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-364042/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 364332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	300.0	
LCS 680-364332/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-364332/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-364332/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 365005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	300.0	
LCS 680-365005/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-365005/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-365005/2	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 160733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total Recoverable	Water	3005A	
240-45265-6 MS	OC-M14L2B	Total Recoverable	Water	3005A	
240-45265-6 MSD	OC-M14L2B	Total Recoverable	Water	3005A	
240-45265-7	OC-M24L72A	Total Recoverable	Water	3005A	
240-45265-8	OC-M24L65	Total Recoverable	Water	3005A	
240-45265-9	OC-M24L64	Total Recoverable	Water	3005A	
240-45265-10	OC-M24L87	Total Recoverable	Water	3005A	
240-45265-12	OC-M24L66	Total Recoverable	Water	3005A	
240-45265-13	OC-M24L94	Total Recoverable	Water	3005A	
240-45265-14	OC-M24L63	Total Recoverable	Water	3005A	
240-45331-1	OC-M15L2C	Total Recoverable	Water	3005A	
240-45331-2	OC-M02L07	Total Recoverable	Water	3005A	
LCS 240-160733/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 240-160733/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 240-160733/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 161114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total Recoverable	Water	6010	160733
240-45265-6 MS	OC-M14L2B	Total Recoverable	Water	6010	160733
240-45265-6 MSD	OC-M14L2B	Total Recoverable	Water	6010	160733
240-45265-7	OC-M24L72A	Total Recoverable	Water	6010	160733
240-45265-8	OC-M24L65	Total Recoverable	Water	6010	160733

Metals (Continued)

Analysis Batch: 161114 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-9	OC-M24L64	Total Recoverable	Water	6010	160733
240-45265-10	OC-M24L87	Total Recoverable	Water	6010	160733
240-45265-12	OC-M24L66	Total Recoverable	Water	6010	160733
240-45265-13	OC-M24L94	Total Recoverable	Water	6010	160733
240-45265-14	OC-M24L63	Total Recoverable	Water	6010	160733
240-45331-1	OC-M15L2C	Total Recoverable	Water	6010	160733
240-45331-2	OC-M02L07	Total Recoverable	Water	6010	160733
LCS 240-160733/2-A	Lab Control Sample	Total Recoverable	Water	6010	160733
LCSD 240-160733/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	160733
MB 240-160733/1-A	Method Blank	Total Recoverable	Water	6010	160733

Prep Batch: 161420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total Recoverable	Water	3005A	
240-45524-2 MS	OC-M24L54	Total Recoverable	Water	3005A	
240-45524-2 MSD	OC-M24L54	Total Recoverable	Water	3005A	
LCS 240-161420/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 240-161420/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 240-161420/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 161791

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total Recoverable	Water	6010	161420
240-45524-2 MS	OC-M24L54	Total Recoverable	Water	6010	161420
240-45524-2 MSD	OC-M24L54	Total Recoverable	Water	6010	161420
LCS 240-161420/2-A	Lab Control Sample	Total Recoverable	Water	6010	161420
LCSD 240-161420/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	161420
MB 240-161420/1-A	Method Blank	Total Recoverable	Water	6010	161420

General Chemistry

Analysis Batch: 99580

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total/NA	Water	7196A	
240-45265-6 MS	OC-M14L2B	Total/NA	Water	7196A	
240-45265-6 MSD	OC-M14L2B	Total/NA	Water	7196A	
240-45265-9	OC-M24L64	Total/NA	Water	7196A	
240-45265-10	OC-M24L87	Total/NA	Water	7196A	
240-45265-13	OC-M24L94	Total/NA	Water	7196A	
240-45265-14	OC-M24L63	Total/NA	Water	7196A	
LCS 360-99580/10	Lab Control Sample	Total/NA	Water	7196A	
LCSD 360-99580/11	Lab Control Sample Dup	Total/NA	Water	7196A	
MB 360-99580/9	Method Blank	Total/NA	Water	7196A	

Analysis Batch: 99586

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45331-1	OC-M15L2C	Total/NA	Water	7196A	
240-45331-1 MS	OC-M15L2C	Total/NA	Water	7196A	
240-45331-1 MSD	OC-M15L2C	Total/NA	Water	7196A	
240-45331-2	OC-M02L07	Total/NA	Water	7196A	

General Chemistry (Continued)

Analysis Batch: 99586 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 360-99586/10	Lab Control Sample	Total/NA	Water	7196A	
LCSD 360-99586/11	Lab Control Sample Dup	Total/NA	Water	7196A	
MB 360-99586/9	Method Blank	Total/NA	Water	7196A	

Analysis Batch: 99599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	7196A	
240-45524-2 MS	OC-M24L54	Total/NA	Water	7196A	
240-45524-2 MSD	OC-M24L54	Total/NA	Water	7196A	
LCS 360-99599/10	Lab Control Sample	Total/NA	Water	7196A	
LCSD 360-99599/11	Lab Control Sample Dup	Total/NA	Water	7196A	
MB 360-99599/9	Method Blank	Total/NA	Water	7196A	

Analysis Batch: 362790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-7	OC-M24L72A	Total/NA	Water	353.2	
240-45265-7 MS	OC-M24L72A	Total/NA	Water	353.2	
240-45265-7 MSD	OC-M24L72A	Total/NA	Water	353.2	
240-45265-8	OC-M24L65	Total/NA	Water	353.2	
240-45265-9	OC-M24L64	Total/NA	Water	353.2	
240-45265-10	OC-M24L87	Total/NA	Water	353.2	
240-45265-12	OC-M24L66	Total/NA	Water	353.2	
240-45265-12 DU	OC-M24L66	Total/NA	Water	353.2	
240-45265-13	OC-M24L94	Total/NA	Water	353.2	
240-45265-14	OC-M24L63	Total/NA	Water	353.2	
LCS 680-362790/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-362790/13	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 363015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45331-1	OC-M15L2C	Total/NA	Water	353.2	
240-45331-1 MS	OC-M15L2C	Total/NA	Water	353.2	
240-45331-1 MSD	OC-M15L2C	Total/NA	Water	353.2	
240-45331-2	OC-M02L07	Total/NA	Water	353.2	
240-45331-2 DU	OC-M02L07	Total/NA	Water	353.2	
LCS 680-363015/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-363015/13	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 363636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45524-2	OC-M24L54	Total/NA	Water	353.2	
240-45524-2 MS	OC-M24L54	Total/NA	Water	353.2	
240-45524-2 MSD	OC-M24L54	Total/NA	Water	353.2	
LCS 680-363636/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-363636/13	Method Blank	Total/NA	Water	353.2	

Prep Batch: 364133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total/NA	Water	Distill/Ammonia	
240-45265-6 MS	OC-M14L2B	Total/NA	Water	Distill/Ammonia	
240-45265-6 MSD	OC-M14L2B	Total/NA	Water	Distill/Ammonia	

General Chemistry (Continued)

Prep Batch: 364133 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-7	OC-M24L72A	Total/NA	Water	Distill/Ammonia	
240-45265-8	OC-M24L65	Total/NA	Water	Distill/Ammonia	
240-45265-9	OC-M24L64	Total/NA	Water	Distill/Ammonia	
240-45265-10	OC-M24L87	Total/NA	Water	Distill/Ammonia	
240-45265-12	OC-M24L66	Total/NA	Water	Distill/Ammonia	
240-45265-13	OC-M24L94	Total/NA	Water	Distill/Ammonia	
240-45265-14	OC-M24L63	Total/NA	Water	Distill/Ammonia	
240-45331-1	OC-M15L2C	Total/NA	Water	Distill/Ammonia	
240-45331-2	OC-M02L07	Total/NA	Water	Distill/Ammonia	
240-45524-2	OC-M24L54	Total/NA	Water	Distill/Ammonia	
240-45524-2 DU	OC-M24L54	Total/NA	Water	Distill/Ammonia	
LCS 680-364133/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
LCSD 680-364133/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/Ammonia	
MB 680-364133/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 364360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-45265-6	OC-M14L2B	Total/NA	Water	350.1	364133
240-45265-6 MS	OC-M14L2B	Total/NA	Water	350.1	364133
240-45265-6 MSD	OC-M14L2B	Total/NA	Water	350.1	364133
240-45265-7	OC-M24L72A	Total/NA	Water	350.1	364133
240-45265-8	OC-M24L65	Total/NA	Water	350.1	364133
240-45265-9	OC-M24L64	Total/NA	Water	350.1	364133
240-45265-10	OC-M24L87	Total/NA	Water	350.1	364133
240-45265-12	OC-M24L66	Total/NA	Water	350.1	364133
240-45265-13	OC-M24L94	Total/NA	Water	350.1	364133
240-45265-14	OC-M24L63	Total/NA	Water	350.1	364133
240-45331-1	OC-M15L2C	Total/NA	Water	350.1	364133
240-45331-2	OC-M02L07	Total/NA	Water	350.1	364133
240-45524-2	OC-M24L54	Total/NA	Water	350.1	364133
240-45524-2 DU	OC-M24L54	Total/NA	Water	350.1	364133
LCS 680-364133/2-A	Lab Control Sample	Total/NA	Water	350.1	364133
LCSD 680-364133/3-A	Lab Control Sample Dup	Total/NA	Water	350.1	364133
MB 680-364133/1-A	Method Blank	Total/NA	Water	350.1	364133

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M03L02
Lab Sample ID: 240-45265-1
Date Collected: 12/09/14 08:18
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 19:33	VMN	TAL SAC

Client Sample ID: OC-M03L2D
Lab Sample ID: 240-45265-2
Date Collected: 12/09/14 08:25
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 20:11	VMN	TAL SAC

Client Sample ID: OC-M03L2F
Lab Sample ID: 240-45265-3
Date Collected: 12/09/14 08:40
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 20:49	VMN	TAL SAC

Client Sample ID: OC-M03L07
Lab Sample ID: 240-45265-4
Date Collected: 12/09/14 09:05
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 21:27	VMN	TAL SAC

Client Sample ID: OC-M01L06
Lab Sample ID: 240-45265-5
Date Collected: 12/09/14 09:55
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 22:05	VMN	TAL SAC

Client Sample ID: OC-M14L2B
Lab Sample ID: 240-45265-6
Date Collected: 12/09/14 10:15
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 22:44	VMN	TAL SAC

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M14L2B

Lab Sample ID: 240-45265-6

Date Collected: 12/09/14 10:15
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	362702	12/11/14 09:34	CMB	TAL SAV
Total/NA	Analysis	300.0		1	363655	12/17/14 12:34	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:01	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 14:53	JME	TAL SAV
Total/NA	Analysis	7196A		1	99580	12/10/14 10:00	RWE	TAL WFD

Client Sample ID: OC-M24L72A

Lab Sample ID: 240-45265-7

Date Collected: 12/09/14 10:53
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/23/14 23:22	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 13:20	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:21	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 14:53	JME	TAL SAV
Total/NA	Analysis	353.2		5	362790	12/11/14 10:26	GRX	TAL SAV

Client Sample ID: OC-M24L65

Lab Sample ID: 240-45265-8

Date Collected: 12/09/14 11:08
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 00:00	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 13:36	AJO	TAL SAV
Total/NA	Analysis	300.0		2	363655	12/17/14 16:56	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:25	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		1	362790	12/11/14 10:31	GRX	TAL SAV

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L64

Lab Sample ID: 240-45265-9

Date Collected: 12/09/14 11:21
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			160933	12/15/14 06:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	161554	12/18/14 15:31	TMH	TAL CAN
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 00:38	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 13:51	AJO	TAL SAV
Total/NA	Analysis	300.0		4	363655	12/17/14 17:12	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:29	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		1	362790	12/11/14 10:32	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99580	12/10/14 10:00	RWE	TAL WFD

Client Sample ID: OC-M24L87

Lab Sample ID: 240-45265-10

Date Collected: 12/09/14 12:20
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 01:16	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 14:07	AJO	TAL SAV
Total/NA	Analysis	300.0		4	363655	12/17/14 17:58	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:41	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		1	362790	12/11/14 10:35	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99580	12/10/14 10:00	RWE	TAL WFD

Client Sample ID: OC-M24L116

Lab Sample ID: 240-45265-11

Date Collected: 12/09/14 12:35
Matrix: Water
Date Received: 12/10/14 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 01:54	VMN	TAL SAC

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L66

Date Collected: 12/09/14 13:06
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 02:32	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 14:53	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:45	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		1	362790	12/11/14 10:37	GRX	TAL SAV

Client Sample ID: OC-M24L94

Date Collected: 12/09/14 13:22
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			160933	12/15/14 06:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	161554	12/18/14 15:54	TMH	TAL CAN
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 03:10	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 15:08	AJO	TAL SAV
Total/NA	Analysis	300.0		10	364042	12/19/14 11:10	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:49	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		5	362790	12/11/14 10:39	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99580	12/10/14 10:00	RWE	TAL WFD

Client Sample ID: OC-M24L63

Date Collected: 12/09/14 13:58
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			160933	12/15/14 06:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	161554	12/18/14 16:16	TMH	TAL CAN
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 03:48	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 15:24	AJO	TAL SAV
Total/NA	Analysis	300.0		4	363655	12/17/14 18:44	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:53	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M24L63

Date Collected: 12/09/14 13:58
Date Received: 12/10/14 09:40

Lab Sample ID: 240-45265-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	353.2		1	362790	12/11/14 10:40	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99580	12/10/14 10:00	RWE	TAL WFD

Client Sample ID: OC-M15L2C

Date Collected: 12/10/14 11:29
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			161139	12/16/14 06:55	JDR	TAL CAN
Total/NA	Analysis	8270D		1	161554	12/18/14 16:38	TMH	TAL CAN
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 04:26	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 15:39	AJO	TAL SAV
Total/NA	Analysis	300.0		4	363831	12/17/14 20:45	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 10:57	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		1	363015	12/12/14 11:34	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99586	12/11/14 10:25	RWE	TAL WFD

Client Sample ID: OC-M02L07

Date Collected: 12/10/14 11:57
Date Received: 12/11/14 09:45

Lab Sample ID: 240-45331-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			161139	12/16/14 06:55	JDR	TAL CAN
Total/NA	Analysis	8270D		1	161554	12/18/14 17:00	TMH	TAL CAN
Total/NA	Prep	3510C			60679	12/15/14 10:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 05:04	VMN	TAL SAC
Total/NA	Analysis	300.0		1	363655	12/17/14 15:55	AJO	TAL SAV
Total Recoverable	Prep	3005A			160733	12/12/14 09:47	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161114	12/15/14 11:01	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 15:47	JME	TAL SAV
Total/NA	Analysis	353.2		25	363015	12/12/14 11:38	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99586	12/11/14 10:25	RWE	TAL WFD

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Client Sample ID: OC-M01L6D

Lab Sample ID: 240-45524-1

Date Collected: 12/15/14 11:27
Matrix: Water
Date Received: 12/16/14 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			61026	12/18/14 10:29	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61465	12/24/14 09:33	VMN	TAL SAC

Client Sample ID: OC-M24L54

Lab Sample ID: 240-45524-2

Date Collected: 12/15/14 15:14
Matrix: Water
Date Received: 12/16/14 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			161776	12/19/14 07:04	EMB	TAL CAN
Total/NA	Analysis	8270D		1	161956	12/20/14 11:52	TMH	TAL CAN
Total/NA	Prep	3510C			61026	12/18/14 10:29	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	61432	12/20/14 06:15	VMN	TAL SAC
Total/NA	Analysis	300.0		1	364332	12/20/14 15:02	DAS	TAL SAV
Total/NA	Analysis	300.0		2	365005	12/24/14 11:27	SMC	TAL SAV
Total Recoverable	Prep	3005A			161420	12/17/14 09:57	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	161791	12/18/14 13:46	ADS	TAL CAN
Total/NA	Prep	Distill/Ammonia			364133	12/19/14 11:27	JME	TAL SAV
Total/NA	Analysis	350.1		1	364360	12/19/14 14:53	JME	TAL SAV
Total/NA	Analysis	353.2		1	363636	12/17/14 10:30	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99599	12/16/14 11:46	RWE	TAL WFD

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-15 *
Connecticut	State Program	1	PH-0590	12-31-15
Florida	NELAP	4	E87225	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200004	07-31-15
Kansas	NELAP	7	E-10336	01-31-15 *
Kentucky (UST)	State Program	4	58	06-30-15
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-15
Nevada	State Program	9	OH-000482008A	07-31-15
New Jersey	NELAP	2	OH001	06-30-15
New York	NELAP	2	10975	03-31-15 *
Ohio VAP	State Program	5	CL0024	10-31-15
Pennsylvania	NELAP	3	68-00340	08-31-15
Texas	NELAP	6		08-31-15
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-15
Washington	State Program	10	C971	01-12-15 *
West Virginia DEP	State Program	3	210	12-31-14 *
Wisconsin	State Program	5	999518190	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-16
Alaska (UST)	State Program	10	UST-055	12-18-15
Arizona	State Program	9	AZ0708	08-11-15
Arkansas DEQ	State Program	6	88-0691	06-17-15
California	State Program	9	2897	01-31-15
Colorado	State Program	8	N/A	08-31-15
Connecticut	State Program	1	PH-0691	06-30-15
Florida	NELAP	4	E87570	06-30-15
Hawaii	State Program	9	N/A	01-29-16
Illinois	NELAP	5	200060	03-17-15
Kansas	NELAP	7	E-10375	10-31-15
Louisiana	NELAP	6	30612	06-30-15
Michigan	State Program	5	9947	01-31-15
Nebraska	State Program	7	NE-OS-22-13	01-29-15
Nevada	State Program	9	CA44	07-31-15
New Jersey	NELAP	2	CA005	06-30-15
New York	NELAP	2	11666	04-01-15
Oregon	NELAP	10	CA200005	01-29-16
Oregon	NELAP Secondary AB	10	E87570	06-30-15

* Certification renewal pending - certification considered valid.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Laboratory: TestAmerica Sacramento (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Pennsylvania	NELAP	3	9947	03-31-15
Texas	NELAP	6	T104704399-08-TX	05-31-15
US Fish & Wildlife	Federal		LE148388-0	02-28-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-15
Washington	State Program	10	C581	05-05-15
West Virginia (DW)	State Program	3	9930C	12-31-14 *
Wyoming	State Program	8	8TMS-Q	01-29-15

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-15
Arkansas DEQ	State Program	6	88-0692	01-31-15
California	NELAP	9	3217CA	07-31-14 *
Colorado	State Program	8	N/A	12-31-14 *
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-15
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	N/A	06-30-15
Georgia	State Program	4	803	06-30-15
Guam	State Program	9	09-005r	04-16-15
Hawaii	State Program	9	N/A	06-30-15
Illinois	NELAP	5	200022	11-30-14 *
Indiana	State Program	5	N/A	06-30-15
Iowa	State Program	7	353	07-01-15
Kentucky (DW)	State Program	4	90084	12-31-14 *
Kentucky (UST)	State Program	4	18	06-30-15
Louisiana	NELAP	6	30690	06-30-15
Louisiana (DW)	NELAP	6	LA140023	12-31-14 *
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-14 *
Massachusetts	State Program	1	M-GA006	06-30-15
Michigan	State Program	5	9925	06-30-15
Mississippi	State Program	4	N/A	06-30-15
Montana	State Program	8	CERT0081	12-31-15
Nebraska	State Program	7	TestAmerica-Savannah	06-30-15
New Jersey	NELAP	2	GA769	06-30-15
New Mexico	State Program	6	N/A	06-30-15
New York	NELAP	2	10842	03-31-15
North Carolina (DW)	State Program	4	13701	07-31-15
North Carolina (WW/SW)	State Program	4	269	12-31-15
Oklahoma	State Program	6	9984	08-31-15
Pennsylvania	NELAP	3	68-00474	06-30-15
Puerto Rico	State Program	2	GA00006	12-31-14 *

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Laboratory: TestAmerica Savannah (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
South Carolina	State Program	4	98001	06-30-15
Tennessee	State Program	4	TN02961	06-30-15
Texas	NELAP	6	T104704185-14-7	11-30-15
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-15
Washington	State Program	10	C805	06-10-15
West Virginia (DW)	State Program	3	9950C	12-31-14 *
West Virginia DEP	State Program	3	094	06-30-15
Wisconsin	State Program	5	999819810	08-31-15
Wyoming	State Program	8	8TMS-L	06-30-15

Laboratory: TestAmerica Westfield

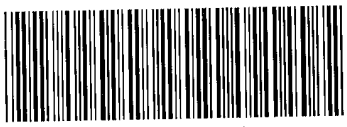
All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0494	09-30-16
Massachusetts	State Program	1	M-MA014	06-30-15
New Hampshire	NELAP	1	2539	08-08-15

* Certification renewal pending - certification considered valid.

TestAmerica Laboratories, Inc.

CHAIN OF CUSTODY AND RECEIVING DOCUMENTS



240-45265 Chain of Custody

4101 Shuffel Street, N.W. North Canton, OH 44720 **tel** 330.497.9396 **fax** 330.497.0772 **www.testamericainc.com**

Chain of Custody Record

Temperature on Receipt 3.6

Drinking Water? Yes ☑ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Amec / Olin	Peter Thompson	12/9/14	262219
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 2**
51 Eames St	207 828 3490		
City / **State** / **Zip Code**	**Site Contact** / **Lab Contact**		
Wilmington / MA / 01887	Chris Mazzola / Becky Mason		
Project Name and Location (State)	**Carrier/Waybill Number**		
Olin Wilmington, MA			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Mod. 521	SVOCs (8270C)	Cr / Na	Cr+6 7196	NO2 / NO3 / SO4 / Cl	Ammonia	Special Instructions/ Conditions of Receipt
OC-M03L02	12/9/14	0818		X			X						2						Cr+6 7196 approved (hold issue)
OC-M03L2D		0825		X			X						2						
OC-M03L2F		0840		X			X						2						
OC-M03L07		0905		X			X						2						
OC-M01L06		0955		X			X						2						
OC-M14L2B		1015		X			X	X	X				2		1	1	1	1	
OC-M24L72A		1053		X			X	X	X				2		1		1	1	
OC-M24L65		1108		X			X	X	X				2		1		1	1	
OC-M24L64		1121		X			X	X	X				2	2	1	1	1	1	
OC-M24L87		1220		X			X	X	X				2		1	1	1	1	
OC-M24L116		1235		X			X						2						
OC-M24L66		1306		X									2		1		1	1	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1.		12/9/14	1540		12.9.14	1540
2.		12.9.14	1700		12/10/14	9:40
3.						

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☑ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Amec / Olin	Peter Thompson	12/9/14	256364
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 2 of 2**
51 Eames St	207 828 3490		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Wilmington / MA / 01887	Chris Mazzolini	Becky Mason	
Project Name and Location (State)	**Carrier/Waybill Number**		
Olin Wilmington MA			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: Mod 521	SVOCs 8270c	Cr / Mo	Cr+6 7196	Cr / Mo / NO3/SO4	Ammonia	Special Instructions/ Conditions of Receipt
OC-MZ4L94	12/9/14	1322		X			X	X	X				2	2	1	1	1	1	Cr+6 7196 approved (Hold issue)
OC-MZ4L63	12/9/14	1358		X			X	X	X				2	2	1	1	1	1	

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other Standard

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1.		12/9/14	1540		12.9.14	1540
2.		12-9-14	1700		12/10/14	9:40
3.						

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 45265**
Canton Facility

Client Amec / Olin Site Name Olin
Cooler Received on 12/10/14 Opened on 12/10/14
Cooler unpacked by: Heather Powell
FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____
Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
   IR GUN# A (CF +4.0 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
   IR GUN# 4 (CF +1.2 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C ☐ See Multiple Cooler Form
   IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
   IR GUN# 8 (CF +0.7 °C) Observed Cooler Temp. 3.6 °C Corrected Cooler Temp. 4.3 °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Did all bottles arrive in good condition (Unbroken)? Yes No
7. Could all bottle labels be reconciled with the COC? Yes No
8. Were correct bottle(s) used for the test(s) indicated? Yes No
9. Sufficient quantity received to perform indicated analyses? Yes No
10. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC425511
11. Were VOAs on the COC? Yes No
12. Were air bubbles >6 mm in any VOA vials? Yes No NA
13. Was a trip blank present in the cooler(s)? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other
Concerning

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: JM

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

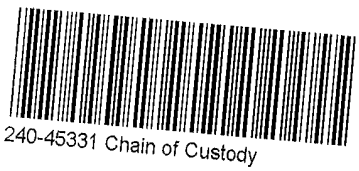
Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
OC-M14L2B	240-45265-A-6	Plastic 250ml - with Nitric Acid	<2		
OC-M14L2B	240-45265-B-6	Plastic 250ml - with Sulfuric Acid	<2		
OC-M14L2B	240-45265-E-6	Plastic 250ml - with Sulfuric Acid			
OC-M24L72A	240-45265-A-7	Plastic 250ml - with Nitric Acid	<2		
OC-M24L72A	240-45265-C-7	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L65	240-45265-A-8	Plastic 250ml - with Nitric Acid	<2		
OC-M24L65	240-45265-C-8	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L64	240-45265-C-9	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L64	240-45265-D-9	Plastic 250ml - with Nitric Acid	<2		
OC-M24L87	240-45265-A-10	Plastic 250ml - with Nitric Acid	<2		
OC-M24L87	240-45265-B-10	Plastic 250ml - with Sulfuric Acid			
OC-M24L66	240-45265-A-12	Plastic 250ml - with Nitric Acid	<2		
OC-M24L66	240-45265-C-12	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L94	240-45265-C-13	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L94	240-45265-D-13	Plastic 250ml - with Nitric Acid	<2		
OC-M24L63	240-45265-C-14	Plastic 250ml - with Sulfuric Acid	<2		
OC-M24L63	240-45265-D-14	Plastic 250ml - with Nitric Acid	<2		

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS



Chain of Custody Record

0.2

Temperature on Receipt _____

Drinking Water? Yes ☒ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Amec / Olin	Peter Thompson	12/10/14	256365
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
51 Eames St	207 828 3490		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Wilmington / MA / 01887	Chris Mazzola	Becky Mason	
Project Name and Location (State)	**Carrier/Waybill Number**		
Olin Wilmington MA			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Med 522	SVOCs 8270C	Cr/Na	Cr+6 7196	Cl/NO2/NO3/SO4	Ammonia	Special Instructions/ Conditions of Receipt
OC-M15L2C	12/10/14	1129		X			X	X	X				2	2	1	1	1	1	Cr+6 7196 (Hold Time)
OC-M02L07	12/10/14	1157		X			X	X	X				2	2	1	1	1	1	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1.		12/10/14	1445		12/10/14	1445
2.		12/10/14	1645		12/10/14	1645
3.		12/10/14	1700		12/11/14	9:45

Comments
8.4C / Ice - Westfield

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 45331
Canton Facility

Client Amec / Olin Site Name Olin Wilmington Cooler unpacked by: [signature]

Cooler Received on 12/11/14 Opened on 12/11/14

FedEx: f^t Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
   - IR GUN# A (CF +4.0 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   - IR GUN# 4 (CF +1.2 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C ☐ See Multiple Cooler Form
   - IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   - IR GUN# 8 (CF +0.7 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.9 °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   - -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   - -Were custody seals on the bottle(s)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Did all bottles arrive in good condition (Unbroken)? Yes No
7. Could all bottle labels be reconciled with the COC? Yes No
8. Were correct bottle(s) used for the test(s) indicated? Yes No
9. Sufficient quantity received to perform indicated analyses? Yes No
10. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC425511**
11. Were VOAs on the COC? Yes No
12. Were air bubbles >6 mm in any VOA vials? Yes No NA
13. Was a trip blank present in the cooler(s)? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other
Concerning

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: [signature]

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____.

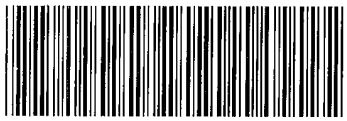
Ref: SOP NC-SC-0005, Sample Receiving
L:\QAQC\QA Department\QA TARDIS\Document Control\Work Instructions\WI_QA use only\WI-NC-099M-110614 Cooler Receipt Form.doc djl

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
OC-M15L2C	240-45331-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
OC-M15L2C	240-45331-H-1	Plastic 250ml - with Sulfuric Acid	<2	_____	_____
OC-M02L07	240-45331-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
OC-M02L07	240-45331-H-2	Plastic 250ml - with Sulfuric Acid	<2	_____	_____

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS



240-45524 Chain of Custody

4101 Shuffel Street, N.W. North Canton, OH 44720 **tel** 330.497.9396 **fax** 330.497.0772 **www.testamericainc.com**

Chain of Custody Record

Temperature on Receipt 0.8

Drinking Water? Yes ☒ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: Amec / Olin	Project Manager: Peter Thompson	Date: 12/15/14	Chain of Custody Number: 262221
Address: 51 Eames St	Telephone Number (Area Code)/Fax Number: 207 828 3490	Lab Number:	Page 1 of 1
City: Wilmington; State: MA; Zip Code: 01887	Site Contact: Chris Mazzolini; Lab Contact: Becky Mason		
Project Name and Location (State): Olin Wilmington, MA	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Analysis (Attach list if more space is needed)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Mod 521	SVOCs 8270C	Cr/Na	Cr+6 7196	Cl/NO2/NO3/SO4	Ammonia	Special Instructions/ Conditions of Receipt
OC-M01L6D	12/15/14	1127		X			X	~~8~~					X						Cr+6 7196 (hold issues)
OC-M24L54	12/15/14	1514		X			X	X	X				X	X	X	X	X	X	

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: [signature]	12/15/14	1525	1. Received By: [signature]	12-15-14	1545
2. Relinquished By: [signature]	12-15-14	1630	2. Received By: Jessie Bonoi	12/16/14	10:05
3. Relinquished By:			3. Received By:		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica Canton Sample Receipt Form/Narrative Login # : 45524
Canton Facility

Client AMEC Site Name Olin Cooler unpacked by: Jessie Bonori

Cooler Received on 12/16/14 Opened on 12/16/14

FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # ~~Foam Box~~ Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam ~~Plastic Bag~~ ~~None~~ Other

COOLANT: ~~Wet Ice~~ ~~Blue Ice~~ ~~Dry Ice~~ ~~Water~~ ~~None~~

1. Cooler temperature upon receipt

IR GUN# A	(CF +4.0 °C)	Observed Cooler Temp. ____ °C	Corrected Cooler Temp. ____ °C	☐ See Multiple Cooler Form
IR GUN# 4	(CF +1.2 °C)	Observed Cooler Temp. ____ °C	Corrected Cooler Temp. ____ °C	
IR GUN# 5	(CF +0.4 °C)	Observed Cooler Temp. ____ °C	Corrected Cooler Temp. ____ °C	
IR GUN# 8	(CF +0.7 °C)	Observed Cooler Temp. 0.8 °C	Corrected Cooler Temp. 1.5 °C	

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity ____	Yes	No
-Were custody seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were custody seals on the bottle(s)?	Yes	No
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Did all bottles arrive in good condition (Unbroken)?	Yes	No
7. Could all bottle labels be reconciled with the COC?	Yes	No
8. Were correct bottle(s) used for the test(s) indicated?	Yes	No
9. Sufficient quantity received to perform indicated analyses?	Yes	No
10. Were sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC425511
11. Were VOAs on the COC?	Yes	No
12. Were air bubbles >6 mm in any VOA vials?	Yes	No NA
13. Was a trip blank present in the cooler(s)?	Yes	No

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

15. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

Ref: SOP NC-SC-0005, Sample Receiving
L:\QAQC\QA Department\QA TARDIS\Document Control\Work Instructions\WI_QA use only\WI-NC-099M-110614 Cooler Receipt Form.doc djl

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45265

List Source: TestAmerica Canton

List Number: 2

Creator: Maddux, Ann

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45265
List Number: 3
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento
List Creation: 12/10/14 05:48 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45265
List Number: 4
Creator: Conner, Keaton

List Source: TestAmerica Savannah
List Creation: 12/11/14 08:20 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45265
List Number: 5
Creator: Emerich, Rich W

List Source: TestAmerica Westfield
List Creation: 12/11/14 09:05 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45331

List Source: TestAmerica Canton

List Number: 2

Creator: Maddux, Ann

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45331
List Number: 4
Creator: Yang, Nhia X

List Source: TestAmerica Sacramento
List Creation: 12/12/14 11:06 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45331
List Number: 3
Creator: Conner, Keaton

List Source: TestAmerica Savannah
List Creation: 12/11/14 07:29 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45331
List Number: 5
Creator: Emerich, Rich W

List Source: TestAmerica Westfield
List Creation: 12/12/14 04:03 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45524
List Number: 4
Creator: Yang, Nhia X

List Source: TestAmerica Sacramento
List Creation: 12/17/14 12:21 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45524
List Number: 2
Creator: Conner, Keaton

List Source: TestAmerica Savannah
List Creation: 12/17/14 09:06 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-45265-1

Login Number: 45524
List Number: 3
Creator: Emerich, Rich W

List Source: TestAmerica Westfield
List Creation: 12/17/14 12:38 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Isotope Dilution Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-45265-1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	NDMA (25-150)	NDNP (25-150)						
240-45265-1	OC-M03L02	40	80						
240-45265-2	OC-M03L2D	41	72						
240-45265-3	OC-M03L2F	39	70						
240-45265-4	OC-M03L07	39	64						
240-45265-5	OC-M01L06	38	68						
240-45265-6	OC-M14L2B	39	69						
240-45265-7	OC-M24L72A	38	73						
240-45265-8	OC-M24L65	38	68						
240-45265-9	OC-M24L64	40	66						
240-45265-10	OC-M24L87	42	70						
240-45265-11	OC-M24L116	41	62						
240-45265-12	OC-M24L66	37	65						
240-45265-13	OC-M24L94	39	71						
240-45265-14	OC-M24L63	40	70						
240-45331-1	OC-M15L2C	43	69						
240-45331-2	OC-M02L07	38	78						
240-45524-1	OC-M01L6D	40	69						
240-45524-2	OC-M24L54	40	83						
LCS 320-60679/2-A	Lab Control Sample	39	83						
LCS 320-61026/2-A	Lab Control Sample	50	87						
MB 320-60679/1-A	Method Blank	42	75						
MB 320-61026/1-A	Method Blank	47	90						

Surrogate Legend

NDMA = N-Nitrosodimethylamine-d6

NDNP = N-Nitrosodi-n-propylamine-d14

3855 North Ocoee Street Suite 200, Cleveland, TN 37312
(423) 336-4000 FAX (423) 336-4166

To: James Cashwell
From: Randy Morris
Date: May 4, 2015
Subject: Olin Chemical Superfund Site – March 2015 Residential Well Samples

DATA VALIDATION SUMMARY
MARCH 2015 RESIDENTIAL WELLS
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Data Sets 240-48587-1 & 320-12292-1

1.0 INTRODUCTION

Data validation was completed on sample sets containing results for residential well samples collected during the quarterly sampling event completed in March 2015. Samples included in this review are summarized in Table 1. Samples were analyzed by TestAmerica Laboratories (TAL) at locations in Westfield, Massachusetts; Savannah, Georgia; North Canton, Ohio; and West Sacramento, California, and were reported in sample delivery groups (SDGs) 240-48587-1 and 320-12292-1. Samples were analyzed for one or more of the following parameters:

- Semivolatile Organic Compounds (SVOCs) by U.S. Environmental Protection Agency (USEPA) Method 8270D
- n-Nitrosodimethylamine (NDMA) and n-nitrosodi-n-propylamine (NDPrA) by USEPA modified Method 521 (Lab method: WS-MS-0012)
- Metals (chromium and sodium) by USEPA Method 6010
- Hexavalent chromium by USEPA Method 7196A
- Anions by USEPA Method 300.0 (chloride, sulfate) and USEPA Method 353.2 (nitrate, nitrite)
- Ammonia by USEPA 350.1

Sample results and lab data were validated in accordance with the Final Project Operations Plan Volume III-B Quality Assurance Project Plan (QAPP) [MACTEC, 2009]. For SVOCs, validation included 90%Tier II/10%Tier III validation based on USEPA Region I guidelines (USEPA, 1996). For the remaining methods an Olin Level I review was completed as described in the QAPP.

A complete summary of final sample results is included in Table 2. A summary of data qualification actions is included in Table 3. A summary of tentatively identified compounds (TICs) results for

SVOC analyses is presented in Table 4. With the exception of the items discussed below and summarized in Table 3, results are interpreted to be usable as reported by the laboratory.

2.0 SEMIVOLATILES

USEPA Region I Tier III (10%) and Tier II (90%) validation was completed for the SVOC samples based on criteria identified in Method 8270D, the QAPP, and procedures described in USEPA data validation guidelines (USEPA, 1996).

The following information was reviewed during data validation:

* Data Package Narrative, Completeness, and Chain of Custody (COC) Records
  Sample Collection, Preservation, and Holding Times
* Instrument Performance Check (tuning)
* Initial Calibration
  Continuing Calibration Results
  Quality Control (QC) Blanks
  Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
* Surrogate Recoveries
* Internal Standard Response and Retention Times
* Target Compound Identification
  Tentatively Identified Compounds (TICs)
* Calculations, Raw Data, and QC Report Verification
* Electronic Database Review
  Reporting

* = Indicates that all criteria were met for this quality control parameter.

2.1 Validation Observations and Actions

Holding Times

Benzoic acid and aniline had LCS/LCSD percent recoveries below the laboratory QC limit in prep batches 173777 & 174423 respectively. The laboratory performed corrective actions by re-extracting and re-analyzing five affected project samples outside the method holding time of 7 days to extraction (10 days and 9 days respectively) and results met laboratory control criteria. All associated project samples were non-detect for benzoic acid and aniline, and the reporting limits were qualified as estimated (UJ) in accordance with EPA Region I guidelines.

Results qualified due to holding times are presented in Table 3 with a validation reason code of HT.

Continuing Calibration

In the continuing calibration, CCV 174592/2, the percent difference for benzo[g,h,i]perylene (26) exceeded the quality control (QC) limit of 25. Benzo[g,h,i]perylene was not detected in the only project sample associated with this CCV, and the reporting limit was qualified as estimated (UJ).

Results qualified due to continuing calibration percent differences are presented in Table 3 with a validation reason code of CCV%D.

QC Blanks

Caprolactam was detected in method blanks MB 173777/14-A and MB 174423/14-A (0.489 J µg/L and 0.603 J µg/L respectively) associated with project samples. Blank action levels were established at five times the concentrations reported in the method blanks. Sample result concentrations below the action levels and reported in associated samples were qualified as not detected (U) at the reporting limit (RL). Qualified results are presented in Table 3 with a validation reason code of BL1.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

LCS/LCSD percent recovery results were compared to the following project QC limits: 40-140 percent for base neutral fraction compounds and 30-130 percent for acid fraction compounds, with a maximum relative percent difference (RPD) of 20 between the LCS and LCSD percent recoveries.

The LCS and LCSD percent recoveries were outside of control limits in prep batch 173777 for caprolactam (27/32) and benzoic acid (9/9). Four samples were re-prepped and re-analyzed for benzoic acid outside of method hold time as detailed earlier. The lab did not perform corrective action on one sample; therefore the benzoic acid result for that sample (OC-M02L07) was qualified as rejected (R) due to low recoveries. Caprolactam was detected in four of the five field samples associated with this prep batch, but the results were qualified as not detected at the RL due to method blank contamination as detailed above. No additional qualification of these samples is warranted by professional judgment. The reporting limit for the sample (OC-M02L07) that did not have caprolactam detected is qualified as estimated (UJ).

The LCS and LCSD percent recoveries were outside of control limits in prep batch 174423 for caprolactam (22/23), benzoic acid (22/17), and aniline (8,7). The relative percent differences between the LCS and LCSD percent recoveries of benzoic acid (29) and aniline (21) were also outside of control limits. The lone project sample associated with this prep batch (OC-M24L94) was re-prepped and re-analyzed for aniline as detailed earlier. Benzoic acid was not detected in the associated sample and the reporting limit was qualified as estimated (UJ). Caprolactam was also detected in the method blank associated with this prep batch as discussed previously, and the caprolactam result was qualified as not detected at the RL. No further data qualification of the caprolactam result is deemed necessary by professional judgment.

The LCS and LCSD percent recoveries were outside of control limits in prep batch 174965 for benzoic acid (21/21). Benzoic acid was not detected in project samples associated with this prep batch and reporting limits were qualified as estimated (UJ).

Results qualified due to LCS/LCSD recoveries are presented in Table 3 with a validation reason code of LCS-L, and results qualified due to the RPD limit being exceeded are given a validation reason code of LCS-RPD.

TICs

Low concentration TICs (< 6 µg/L) were reported in samples. Results for TICs in the samples that were also in the associated method blank were rejected and not reported in the final data results.

Reporting

N-Nitrosodi-n-propylamine (NDPrA) was reported in both the 8270D and modified 521 methods for a subset of samples. The NDPrA results from modified 521 with lower reporting limits were reported in the final data set.

3.0 NDMA and NDPrA

N-Nitrosodimethylamine (NDMA) analysis was completed using a modified USEPA Method 521 procedure, which provides very low detection limits at an analytical reporting limit of two nanograms per liter (ng/L) for NDMA and NDPrA. NDMA samples are collected in amber-glass bottles and preserved at 4 degrees Celsius prior to analysis.

QC evaluations were based on project specific method performance objectives described in the QAPP [MACTEC, 2009], the TAL Standard Operating Procedure (SOP) WS-MS-0012 for NDMA/NDPrA analysis, and professional judgment of the project chemist. Analytical packages were reviewed using data quality evaluation checklists that were developed specifically for the Olin Chemical Superfund Site. Validation included a full review of all documentation and data associated with sample collection, shipment, and analysis. The following items were reviewed:

* Data Package Narrative, Completeness, and Chain of Custody (COC) Records
* Sample Collection, Preservation, and Holding Times
* Instrument Calibration
* QC Blanks
* LCS
* Internal Standard Recovery
* Reporting Limit Review
* Raw Data Checks and Calculations Verification
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter

4.0 METALS

Samples were analyzed for total chromium and sodium. Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the metals parameters.

The following information was reviewed during data validation:

* Data Package Cover Letter and Narrative
* Sample Collection/COC and Holding Times
  QC Blanks
* LCS/LCSD
* Matrix Spike/Matrix Spike Duplicate (MS/MSD)
* Detection Limit Review
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter.

4.1 Validation Observations and Actions

QC Blanks

Chromium was detected at levels between the method detection limit (MDL) and the reporting limit (RL) in the initial calibration blank (ICB) and all continuing calibration blanks (CCBs) associated with project samples analyzed for metals on March 27. A blank action level was established at five times the highest concentration reported in the blanks. Sample result concentrations below the action level and reported in associated samples were qualified as not detected (U) at the reporting limit. Qualified results are presented in Table 3 with a validation reason code of BL1.

5.0 HEXAVALENT CHROMIUM

Samples were analyzed for hexavalent chromium by method USEPA Method 7196A. Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the metals parameters.

The following information was reviewed during data validation:

* Data Package Cover Letter and Narrative
* Sample Collection/COC and Holding Times
* QC Blanks
* LCS/LCSD
* MS/MSD
* Reporting Limit Review
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter.

6.0 GENERAL CHEMISTRY (AMMONIA, NITRATE, NITRITE, CHLORIDE, AND SULFATE)

Sample results were reviewed using criteria identified in the Olin RI/FS QAPP (MACTEC, 2009). An Olin Level 1 data review was completed on the general chemistry parameters.

The following information was reviewed during data validation:

* Data Package Narrative, Completeness, and COC Records
* Sample Collection, Preservation, and Holding Times
* QC Blanks
* LCS
* Matrix Spike/Matrix Spike Duplicate (MS/MSD)
* Electronic Database Review
* Analytical Method
  Detection/Reporting Limits

* = Indicates that all criteria were met for this quality control parameter.

Reporting Limits

Nitrate and nitrite analyses were completed by the lab using USEPA Method 353.2. An elevated reporting limit of 0.05 mg/L was reported for nitrite.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.

Randy J. Morris

Randy Morris
Environmental Specialist, Data Quality

May 4, 2015
Date

REFERENCES:

MACTEC Engineering and Consulting, Inc. (MACTEC), 2009. "Final Project Operation Plan Volume IIB Quality Assurance Project Plan"; Olin Chemical Superfund Site; 51 Eames Street; Wilmington, Massachusetts; August 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines for Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

Table 1
Sample Summary
Data Validation Report
March 2015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

					Method Class	Inorganics	Ammonia	Nitrate/Nitrite	Metals	Hex Chromium	SVOCs	NDMA/NDPA
					Analysis Method	E300	E350.1	E353.2	SW6010	SW7196A	SW8270D	TANDMA
					Fraction	N	T	T	T	T	N	N
Matrix	**Media**	**Location**	**Field Sample Date**	**Field Sample ID**	**Qc Code**							
L	GW	M-01/L-06C	3/24/2015	OC-M01L6C	FS							2
L	GW	M-01/L-06D	3/25/2015	OC-M01L6D	FS							2
L	GW	M-02/L-07E	3/24/2015	OC-M02L07	FS	2	1	2	2	1	74	2
L	GW	M-03/L-02	3/24/2015	OC-M03L02	FS							2
L	GW	M-03/L-02D	3/24/2015	OC-M03L2D	FS							2
L	GW	M-03/L-02F	3/24/2015	OC-M03L2F	FS							2
L	GW	M-03/L-07	3/24/2015	OC-M03L07	FS							2
L	GW	M-04/L-05C	3/26/2015	OC-M04L5C	FS							2
L	GW	M-14/L-02B	3/24/2015	OC-M14L2B	FS	2	1	2	2	1		2
L	GW	M-15/L-02C	3/24/2015	OC-M15L2C	FS	2	1	2	2	1	75	2
L	GW	M-24/L-116	3/24/2015	OC-M24L116	FS							2
L	GW	M-24/L-54	3/24/2015	OC-M24L54	FS	2	1	2	2	1	77	2
L	GW	M-24/L-63	3/24/2015	OC-M24L63	FS	2	1	2	2	1	76	2
L	GW	M-24/L-64	3/24/2015	OC-M24L64	FS	2	1	2	2	1	76	2
L	GW	M-24/L-65	3/24/2015	OC-M24L65	FS	2	1	2	2			2
L	GW	M-24/L-66	3/24/2015	OC-M24L66	FS	2	1	2	2			2
L	GW	M-24/L-72A	3/24/2015	OC-M24L72A	FS	2	1	2	2			2
L	GW	M-24/L-94	3/25/2015	OC-M24L94	FS	2	1	2	2	1	79	2

Notes:
Number listed under method indicates number of target analytes reported.
SVOC totals include reported TICs.

Prepared by / Date: KMS 4/23/2015
Checked by / Date: RTM 4/24/2015

Table 2
Final Results Summary
Data Validation Report
March 20015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-01/L-06C		M-01/L-06D		M-02/L-07E		M-03/L-02	
		Field Sample Date		3/24/2015		3/25/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M01L6C		OC-M01L6D		OC-M02L07		OC-M03L02	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.2	J	1.2	J	1.9	U	18	
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l					0.96	U		
SW8270D	N	1,2-Dichlorobenzene	ug/l					0.96	U		
SW8270D	N	1-Methylnaphthalene	ug/l					0.19	U		
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l					0.96	U		
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l					9.6	U		
SW8270D	N	2,4,5-Trichlorophenol	ug/l					4.8	U		
SW8270D	N	2,4,6-Trichlorophenol	ug/l					4.8	U		
SW8270D	N	2,4-Dichlorophenol	ug/l					1.9	U		
SW8270D	N	2,4-Dimethylphenol	ug/l					1.9	U		
SW8270D	N	2,4-Dinitrophenol	ug/l					4.8	U		
SW8270D	N	2,4-Dinitrotoluene	ug/l					4.8	U		
SW8270D	N	2,6-Dinitrotoluene	ug/l					4.8	U		
SW8270D	N	2-Chloronaphthalene	ug/l					0.96	U		
SW8270D	N	2-Chlorophenol	ug/l					0.96	U		
SW8270D	N	2-Methylnaphthalene	ug/l					0.19	U		
SW8270D	N	2-Methylphenol	ug/l					0.96	U		
SW8270D	N	2-Nitroaniline	ug/l					1.9	U		
SW8270D	N	2-Nitrophenol	ug/l					1.9	U		
SW8270D	N	3 & 4 Methylphenol	ug/l					1.9	U		
SW8270D	N	3,3'-Dichlorobenzidine	ug/l					4.8	U		
SW8270D	N	3-Nitroaniline	ug/l					1.9	U		
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l					4.8	U		
SW8270D	N	4-Bromophenyl phenyl ether	ug/l					1.9	U		
SW8270D	N	4-Chloro-3-methylphenol	ug/l					1.9	U		
SW8270D	N	4-Chloroaniline	ug/l					1.9	U		
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l					1.9	U		
SW8270D	N	4-Nitroaniline	ug/l					1.9	U		
SW8270D	N	4-Nitrophenol	ug/l					4.8	U		
SW8270D	N	Acenaphthene	ug/l					0.19	U		
SW8270D	N	Acenaphthylene	ug/l					0.19	U		
SW8270D	N	Acetophenone	ug/l					0.96	U		
SW8270D	N	Aniline	ug/l					4.8	U		
SW8270D	N	Anthracene	ug/l					0.19	U		
SW8270D	N	Atrazine	ug/l					0.96	U		
SW8270D	N	Azobenzene	ug/l					9.6	U		
SW8270D	N	Benzaldehyde	ug/l					0.96	U		
SW8270D	N	Benzo(a)anthracene	ug/l					0.19	U		
SW8270D	N	Benzo(a)pyrene	ug/l					0.19	U		
SW8270D	N	Benzo(b)fluoranthene	ug/l					0.19	U		
SW8270D	N	Benzo(ghi)perylene	ug/l					0.19	U		
SW8270D	N	Benzo(k)fluoranthene	ug/l					0.19	U		
SW8270D	N	Benzoic Acid	ug/l						R		
SW8270D	N	Benzyl alcohol	ug/l					4.8	U		
SW8270D	N	Biphenyl	ug/l					0.96	U		

Table 2
Final Results Summary
Data Validation Report
March 20015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-01/L-06C		M-01/L-06D		M-02/L-07E		M-03/L-02	
		Field Sample Date		3/24/2015		3/25/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M01L6C		OC-M01L6D		OC-M02L07		OC-M03L02	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l					0.96	U		
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l					0.96	U		
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l					4.8	U		
SW8270D	N	Butylbenzylphthalate	ug/l					1.9	U		
SW8270D	N	Caprolactam	ug/l					4.8	UJ		
SW8270D	N	Carbazole	ug/l					0.96	U		
SW8270D	N	Chrysene	ug/l					0.19	U		
SW8270D	N	Di-n-butylphthalate	ug/l					4.8	U		
SW8270D	N	Di-n-octylphthalate	ug/l					1.9	U		
SW8270D	N	Dibenz(a,h)anthracene	ug/l					0.19	U		
SW8270D	N	Dibenzofuran	ug/l					0.96	U		
SW8270D	N	Diethylphthalate	ug/l					1.9	U		
SW8270D	N	Dimethylphthalate	ug/l					1.9	U		
SW8270D	N	Diphenyl ether	ug/l					9.6	U		
SW8270D	N	Diphenylmethanone	ug/l					4.8	U		
SW8270D	N	Fluoranthene	ug/l					0.19	U		
SW8270D	N	Fluorene	ug/l					0.19	U		
SW8270D	N	Hexachlorobenzene	ug/l					0.19	U		
SW8270D	N	Hexachlorocyclopentadiene	ug/l					9.6	U		
SW8270D	N	Hexachloroethane	ug/l					0.96	U		
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l					0.19	U		
SW8270D	N	Isophorone	ug/l					0.96	U		
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l					0.96	U		
SW8270D	N	N-Nitrosodiphenylamine	ug/l					0.96	U		
SW8270D	N	Nitrobenzene	ug/l					0.96	U		
SW8270D	N	Pentachlorophenol	ug/l					4.8	U		
SW8270D	N	Phenanthrene	ug/l					0.19	U		
SW8270D	N	Phenol	ug/l					0.96	U		
SW8270D	N	Pyrene	ug/l					0.19	U		
SW6010	T	Chromium	ug/l					10	U		
SW6010	T	Sodium	ug/l					8400			
SW7196A	T	Chromium, Hexavalent	mg/l					0.005	U		
E300	N	Chloride	mg/l					21			
E300	N	Sulfate	mg/l					16			
E350.1	T	Ammonia	mg/l					0.25	U		
E353.2	T	Nitrate as N	mg/l					0.81			
E353.2	T	Nitrite as N	mg/l					0.05	U		

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
N = presumptively present
ug/l = microgram per liter
mg/l = milligram per liter
ng/l = nanogram per liter

Table 2
Final Results Summary
Data Validation Report
March 20015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-03/L-02D		M-03/L-02F		M-03/L-07		M-14/L-02B	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M03L2D		OC-M03L2F		OC-M03L07		OC-M14L2B	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.1	J	1.9	U	1.9	U	1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l								
SW8270D	N	1,2-Dichlorobenzene	ug/l								
SW8270D	N	1-Methylnaphthalene	ug/l								
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l								
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l								
SW8270D	N	2,4,5-Trichlorophenol	ug/l								
SW8270D	N	2,4,6-Trichlorophenol	ug/l								
SW8270D	N	2,4-Dichlorophenol	ug/l								
SW8270D	N	2,4-Dimethylphenol	ug/l								
SW8270D	N	2,4-Dinitrophenol	ug/l								
SW8270D	N	2,4-Dinitrotoluene	ug/l								
SW8270D	N	2,6-Dinitrotoluene	ug/l								
SW8270D	N	2-Chloronaphthalene	ug/l								
SW8270D	N	2-Chlorophenol	ug/l								
SW8270D	N	2-Methylnaphthalene	ug/l								
SW8270D	N	2-Methylphenol	ug/l								
SW8270D	N	2-Nitroaniline	ug/l								
SW8270D	N	2-Nitrophenol	ug/l								
SW8270D	N	3 & 4 Methylphenol	ug/l								
SW8270D	N	3,3'-Dichlorobenzidine	ug/l								
SW8270D	N	3-Nitroaniline	ug/l								
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l								
SW8270D	N	4-Bromophenyl phenyl ether	ug/l								
SW8270D	N	4-Chloro-3-methylphenol	ug/l								
SW8270D	N	4-Chloroaniline	ug/l								
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l								
SW8270D	N	4-Nitroaniline	ug/l								
SW8270D	N	4-Nitrophenol	ug/l								
SW8270D	N	Acenaphthene	ug/l								
SW8270D	N	Acenaphthylene	ug/l								
SW8270D	N	Acetophenone	ug/l								
SW8270D	N	Aniline	ug/l								
SW8270D	N	Anthracene	ug/l								
SW8270D	N	Atrazine	ug/l								
SW8270D	N	Azobenzene	ug/l								
SW8270D	N	Benzaldehyde	ug/l								
SW8270D	N	Benzo(a)anthracene	ug/l								
SW8270D	N	Benzo(a)pyrene	ug/l								
SW8270D	N	Benzo(b)fluoranthene	ug/l								
SW8270D	N	Benzo(ghi)perylene	ug/l								
SW8270D	N	Benzo(k)fluoranthene	ug/l								
SW8270D	N	Benzoic Acid	ug/l								
SW8270D	N	Benzyl alcohol	ug/l								
SW8270D	N	Biphenyl	ug/l								

Table 2
Final Results Summary
Data Validation Report
March 20015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-03/L-02D		M-03/L-02F		M-03/L-07		M-14/L-02B	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M03L2D		OC-M03L2F		OC-M03L07		OC-M14L2B	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l								
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l								
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l								
SW8270D	N	Butylbenzylphthalate	ug/l								
SW8270D	N	Caprolactam	ug/l								
SW8270D	N	Carbazole	ug/l								
SW8270D	N	Chrysene	ug/l								
SW8270D	N	Di-n-butylphthalate	ug/l								
SW8270D	N	Di-n-octylphthalate	ug/l								
SW8270D	N	Dibenz(a,h)anthracene	ug/l								
SW8270D	N	Dibenzofuran	ug/l								
SW8270D	N	Diethylphthalate	ug/l								
SW8270D	N	Dimethylphthalate	ug/l								
SW8270D	N	Diphenyl ether	ug/l								
SW8270D	N	Diphenylmethanone	ug/l								
SW8270D	N	Fluoranthene	ug/l								
SW8270D	N	Fluorene	ug/l								
SW8270D	N	Hexachlorobenzene	ug/l								
SW8270D	N	Hexachlorocyclopentadiene	ug/l								
SW8270D	N	Hexachloroethane	ug/l								
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l								
SW8270D	N	Isophorone	ug/l								
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l								
SW8270D	N	N-Nitrosodiphenylamine	ug/l								
SW8270D	N	Nitrobenzene	ug/l								
SW8270D	N	Pentachlorophenol	ug/l								
SW8270D	N	Phenanthrene	ug/l								
SW8270D	N	Phenol	ug/l								
SW8270D	N	Pyrene	ug/l								
SW6010	T	Chromium	ug/l							10	U
SW6010	T	Sodium	ug/l							37000	
SW7196A	T	Chromium, Hexavalent	mg/l							0.005	U
E300	N	Chloride	mg/l							15	
E300	N	Sulfate	mg/l							120	
E350.1	T	Ammonia	mg/l							0.25	U
E353.2	T	Nitrate as N	mg/l							0.05	U
E353.2	T	Nitrite as N	mg/l							0.05	U

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
N = presumptively present
ug/l = microgram per liter
mg/l = milligram per liter
ng/l = nanogram per liter

Table 2
Final Results Summary
Data Validation Report
March 20015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-15/L-02C		M-24/L-116		M-24/L-54		M-24/L-63	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M15L2C		OC-M24L116		OC-M24L54		OC-M24L63	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.9	U	1.2	J	10		1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	1,2-Dichlorobenzene	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	1-Methylnaphthalene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l	9.5	U			9.5	U	9.5	U
SW8270D	N	2,4,5-Trichlorophenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	2,4,6-Trichlorophenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	2,4-Dichlorophenol	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	2,4-Dimethylphenol	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	2,4-Dinitrophenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	2,4-Dinitrotoluene	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	2,6-Dinitrotoluene	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	2-Chloronaphthalene	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	2-Chlorophenol	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	2-Methylnaphthalene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	2-Methylphenol	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	2-Nitroaniline	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	2-Nitrophenol	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	3 & 4 Methylphenol	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	3,3'-Dichlorobenzidine	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	3-Nitroaniline	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	4-Bromophenyl phenyl ether	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4-Chloro-3-methylphenol	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4-Chloroaniline	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4-Nitroaniline	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	4-Nitrophenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Acenaphthene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Acenaphthylene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Acetophenone	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Aniline	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Anthracene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Atrazine	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Azobenzene	ug/l	9.5	U			9.5	U	9.5	U
SW8270D	N	Benzaldehyde	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Benzo(a)anthracene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Benzo(a)pyrene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Benzo(b)fluoranthene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Benzo(ghi)perylene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Benzo(k)fluoranthene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Benzoic Acid	ug/l	24	UJ			24	UJ	24	UJ
SW8270D	N	Benzyl alcohol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Biphenyl	ug/l	0.95	U			0.95	U	0.95	U

Table 2
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		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-15/L-02C		M-24/L-116		M-24/L-54		M-24/L-63	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M15L2C		OC-M24L116		OC-M24L54		OC-M24L63	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Butylbenzylphthalate	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	Caprolactam	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Carbazole	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Chrysene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Di-n-butylphthalate	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Di-n-octylphthalate	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	Dibenz(a,h)anthracene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Dibenzofuran	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Diethylphthalate	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	Dimethylphthalate	ug/l	1.9	U			1.9	U	1.9	U
SW8270D	N	Diphenyl ether	ug/l	9.5	U			9.5	U	9.5	U
SW8270D	N	Diphenylmethanone	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Fluoranthene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Fluorene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Hexachlorobenzene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Hexachlorocyclopentadiene	ug/l	9.5	U			9.5	U	9.5	U
SW8270D	N	Hexachloroethane	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Isophorone	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	N-Nitrosodiphenylamine	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Nitrobenzene	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Pentachlorophenol	ug/l	4.8	U			4.8	U	4.8	U
SW8270D	N	Phenanthrene	ug/l	0.19	U			0.19	U	0.19	U
SW8270D	N	Phenol	ug/l	0.95	U			0.95	U	0.95	U
SW8270D	N	Pyrene	ug/l	0.19	U			0.19	U	0.19	U
SW6010	T	Chromium	ug/l	10	U			10	U	10	U
SW6010	T	Sodium	ug/l	21000				30000		25000	
SW7196A	T	Chromium, Hexavalent	mg/l	0.005	U			0.005	U	0.005	U
E300	N	Chloride	mg/l	110				81		140	
E300	N	Sulfate	mg/l	27				24		19	
E350.1	T	Ammonia	mg/l	0.25	U			0.25	U	0.25	U
E353.2	T	Nitrate as N	mg/l	0.017	J			0.05	U	0.53	
E353.2	T	Nitrite as N	mg/l	0.05	U			0.05	U	0.05	U

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
N = presumptively present
ug/l = microgram per liter
mg/l = milligram per liter
ng/l = nanogram per liter

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		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-24/L-64		M-24/L-65		M-24/L-66		M-24/L-72A	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M24L64		OC-M24L65		OC-M24L66		OC-M24L72A	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1.9	U	1.9	U	1.9	U	1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l	0.95	U						
SW8270D	N	1,2-Dichlorobenzene	ug/l	0.95	U						
SW8270D	N	1-Methylnaphthalene	ug/l	0.19	U						
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l	0.95	U						
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l	9.5	U						
SW8270D	N	2,4,5-Trichlorophenol	ug/l	4.8	U						
SW8270D	N	2,4,6-Trichlorophenol	ug/l	4.8	U						
SW8270D	N	2,4-Dichlorophenol	ug/l	1.9	U						
SW8270D	N	2,4-Dimethylphenol	ug/l	1.9	U						
SW8270D	N	2,4-Dinitrophenol	ug/l	4.8	U						
SW8270D	N	2,4-Dinitrotoluene	ug/l	4.8	U						
SW8270D	N	2,6-Dinitrotoluene	ug/l	4.8	U						
SW8270D	N	2-Chloronaphthalene	ug/l	0.95	U						
SW8270D	N	2-Chlorophenol	ug/l	0.95	U						
SW8270D	N	2-Methylnaphthalene	ug/l	0.19	U						
SW8270D	N	2-Methylphenol	ug/l	0.95	U						
SW8270D	N	2-Nitroaniline	ug/l	1.9	U						
SW8270D	N	2-Nitrophenol	ug/l	1.9	U						
SW8270D	N	3 & 4 Methylphenol	ug/l	1.9	U						
SW8270D	N	3,3'-Dichlorobenzidine	ug/l	4.8	U						
SW8270D	N	3-Nitroaniline	ug/l	1.9	U						
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l	4.8	U						
SW8270D	N	4-Bromophenyl phenyl ether	ug/l	1.9	U						
SW8270D	N	4-Chloro-3-methylphenol	ug/l	1.9	U						
SW8270D	N	4-Chloroaniline	ug/l	1.9	U						
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l	1.9	U						
SW8270D	N	4-Nitroaniline	ug/l	1.9	U						
SW8270D	N	4-Nitrophenol	ug/l	4.8	U						
SW8270D	N	Acenaphthene	ug/l	0.19	U						
SW8270D	N	Acenaphthylene	ug/l	0.19	U						
SW8270D	N	Acetophenone	ug/l	0.95	U						
SW8270D	N	Aniline	ug/l	4.8	U						
SW8270D	N	Anthracene	ug/l	0.19	U						
SW8270D	N	Atrazine	ug/l	0.95	U						
SW8270D	N	Azobenzene	ug/l	9.5	U						
SW8270D	N	Benzaldehyde	ug/l	0.95	U						
SW8270D	N	Benzo(a)anthracene	ug/l	0.19	U						
SW8270D	N	Benzo(a)pyrene	ug/l	0.19	U						
SW8270D	N	Benzo(b)fluoranthene	ug/l	0.19	U						
SW8270D	N	Benzo(ghi)perylene	ug/l	0.19	U						
SW8270D	N	Benzo(k)fluoranthene	ug/l	0.19	U						
SW8270D	N	Benzoic Acid	ug/l	24	UJ						
SW8270D	N	Benzyl alcohol	ug/l	4.8	U						
SW8270D	N	Biphenyl	ug/l	0.95	U						

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		Lab Sample Delivery Group		240-48587-1		240-48587-1		240-48587-1		240-48587-1	
		Location		M-24/L-64		M-24/L-65		M-24/L-66		M-24/L-72A	
		Field Sample Date		3/24/2015		3/24/2015		3/24/2015		3/24/2015	
		Field Sample ID		OC-M24L64		OC-M24L65		OC-M24L66		OC-M24L72A	
		Qc Code		FS		FS		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l	0.95	U						
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l	0.95	U						
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l	4.8	U						
SW8270D	N	Butylbenzylphthalate	ug/l	1.9	U						
SW8270D	N	Caprolactam	ug/l	4.8	U						
SW8270D	N	Carbazole	ug/l	0.95	U						
SW8270D	N	Chrysene	ug/l	0.19	U						
SW8270D	N	Di-n-butylphthalate	ug/l	4.8	U						
SW8270D	N	Di-n-octylphthalate	ug/l	1.9	U						
SW8270D	N	Dibenz(a,h)anthracene	ug/l	0.19	U						
SW8270D	N	Dibenzofuran	ug/l	0.95	U						
SW8270D	N	Diethylphthalate	ug/l	1.9	U						
SW8270D	N	Dimethylphthalate	ug/l	1.9	U						
SW8270D	N	Diphenyl ether	ug/l	9.5	U						
SW8270D	N	Diphenylmethanone	ug/l	4.8	U						
SW8270D	N	Fluoranthene	ug/l	0.19	U						
SW8270D	N	Fluorene	ug/l	0.19	U						
SW8270D	N	Hexachlorobenzene	ug/l	0.19	U						
SW8270D	N	Hexachlorocyclopentadiene	ug/l	9.5	U						
SW8270D	N	Hexachloroethane	ug/l	0.95	U						
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l	0.19	U						
SW8270D	N	Isophorone	ug/l	0.95	U						
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l	0.95	U						
SW8270D	N	N-Nitrosodiphenylamine	ug/l	0.95	U						
SW8270D	N	Nitrobenzene	ug/l	0.95	U						
SW8270D	N	Pentachlorophenol	ug/l	4.8	U						
SW8270D	N	Phenanthrene	ug/l	0.19	U						
SW8270D	N	Phenol	ug/l	0.95	U						
SW8270D	N	Pyrene	ug/l	0.19	U						
SW6010	T	Chromium	ug/l	10	U	10	U	10	U	10	U
SW6010	T	Sodium	ug/l	22000		16000		2500	J	20000	
SW7196A	T	Chromium, Hexavalent	mg/l	0.005	U						
E300	N	Chloride	mg/l	130		100		3.4		110	
E300	N	Sulfate	mg/l	18		18		8.4		18	
E350.1	T	Ammonia	mg/l	0.25	U	0.25	U	0.25	U	0.25	U
E353.2	T	Nitrate as N	mg/l	0.49		0.53		0.05	U	0.48	
E353.2	T	Nitrite as N	mg/l	0.05	U	0.05	U	0.05	U	0.05	U

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
N = presumptively present
ug/l = microgram per liter
mg/l = milligram per liter
ng/l = nanogram per liter

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		Lab Sample Delivery Group		240-48587-1		320-12292-1	
		Location		M-24/L-94		M-04/L-05C	
		Field Sample Date		3/25/2015		3/26/2015	
		Field Sample ID		OC-M24L94		OC-M04L5C	
		Qc Code		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	ng/l	1.9	U	1.9	U
TANDMA	N	N-Nitrosodimethylamine	ng/l	1	J	1.9	U
SW8270D	N	1,2,4,5-Tetrachlorobenzene	ug/l	0.95	U		
SW8270D	N	1,2-Dichlorobenzene	ug/l	0.95	U		
SW8270D	N	1-Methylnaphthalene	ug/l	0.19	U		
SW8270D	N	2,2'-Dichlorodiisopropylether	ug/l	0.95	U		
SW8270D	N	2,3,4,6-Tetrachlorophenol	ug/l	9.5	U		
SW8270D	N	2,4,5-Trichlorophenol	ug/l	4.8	U		
SW8270D	N	2,4,6-Trichlorophenol	ug/l	4.8	U		
SW8270D	N	2,4-Dichlorophenol	ug/l	1.9	U		
SW8270D	N	2,4-Dimethylphenol	ug/l	1.9	U		
SW8270D	N	2,4-Dinitrophenol	ug/l	4.8	U		
SW8270D	N	2,4-Dinitrotoluene	ug/l	4.8	U		
SW8270D	N	2,6-Dinitrotoluene	ug/l	4.8	U		
SW8270D	N	2-Chloronaphthalene	ug/l	0.95	U		
SW8270D	N	2-Chlorophenol	ug/l	0.95	U		
SW8270D	N	2-Methylnaphthalene	ug/l	0.19	U		
SW8270D	N	2-Methylphenol	ug/l	0.95	U		
SW8270D	N	2-Nitroaniline	ug/l	1.9	U		
SW8270D	N	2-Nitrophenol	ug/l	1.9	U		
SW8270D	N	3 & 4 Methylphenol	ug/l	1.9	U		
SW8270D	N	3,3'-Dichlorobenzidine	ug/l	4.8	U		
SW8270D	N	3-Nitroaniline	ug/l	1.9	U		
SW8270D	N	4,6-Dinitro-2-methylphenol	ug/l	4.8	U		
SW8270D	N	4-Bromophenyl phenyl ether	ug/l	1.9	U		
SW8270D	N	4-Chloro-3-methylphenol	ug/l	1.9	U		
SW8270D	N	4-Chloroaniline	ug/l	1.9	U		
SW8270D	N	4-Chlorophenyl phenyl ether	ug/l	1.9	U		
SW8270D	N	4-Nitroaniline	ug/l	1.9	U		
SW8270D	N	4-Nitrophenol	ug/l	4.8	U		
SW8270D	N	Acenaphthene	ug/l	0.19	U		
SW8270D	N	Acenaphthylene	ug/l	0.19	U		
SW8270D	N	Acetophenone	ug/l	0.95	U		
SW8270D	N	Aniline	ug/l	4.8	UJ		
SW8270D	N	Anthracene	ug/l	0.19	U		
SW8270D	N	Atrazine	ug/l	0.95	U		
SW8270D	N	Azobenzene	ug/l	9.5	U		
SW8270D	N	Benzaldehyde	ug/l	0.95	U		
SW8270D	N	Benzo(a)anthracene	ug/l	0.19	U		
SW8270D	N	Benzo(a)pyrene	ug/l	0.19	U		
SW8270D	N	Benzo(b)fluoranthene	ug/l	0.19	U		
SW8270D	N	Benzo(ghi)perylene	ug/l	0.19	UJ		
SW8270D	N	Benzo(k)fluoranthene	ug/l	0.19	U		
SW8270D	N	Benzoic Acid	ug/l	24	UJ		
SW8270D	N	Benzyl alcohol	ug/l	4.8	U		
SW8270D	N	Biphenyl	ug/l	0.95	U		

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		Lab Sample Delivery Group		240-48587-1		320-12292-1	
		Location		M-24/L-94		M-04/L-05C	
		Field Sample Date		3/25/2015		3/26/2015	
		Field Sample ID		OC-M24L94		OC-M04L5C	
		Qc Code		FS		FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier	Result	Qualifier
SW8270D	N	Bis(2-Chloroethoxy)methane	ug/l	0.95	U		
SW8270D	N	Bis(2-Chloroethyl)ether	ug/l	0.95	U		
SW8270D	N	Bis(2-Ethylhexyl)phthalate	ug/l	4.8	U		
SW8270D	N	Butylbenzylphthalate	ug/l	1.9	U		
SW8270D	N	Caprolactam	ug/l	4.8	U		
SW8270D	N	Carbazole	ug/l	0.95	U		
SW8270D	N	Chrysene	ug/l	0.19	U		
SW8270D	N	Di-n-butylphthalate	ug/l	4.8	U		
SW8270D	N	Di-n-octylphthalate	ug/l	1.9	U		
SW8270D	N	Dibenz(a,h)anthracene	ug/l	0.19	U		
SW8270D	N	Dibenzofuran	ug/l	0.95	U		
SW8270D	N	Diethylphthalate	ug/l	1.9	U		
SW8270D	N	Dimethylphthalate	ug/l	1.9	U		
SW8270D	N	Diphenyl ether	ug/l	9.5	U		
SW8270D	N	Diphenylmethanone	ug/l	4.8	U		
SW8270D	N	Fluoranthene	ug/l	0.19	U		
SW8270D	N	Fluorene	ug/l	0.19	U		
SW8270D	N	Hexachlorobenzene	ug/l	0.19	U		
SW8270D	N	Hexachlorocyclopentadiene	ug/l	9.5	U		
SW8270D	N	Hexachloroethane	ug/l	0.95	U		
SW8270D	N	Indeno(1,2,3-cd)pyrene	ug/l	0.19	U		
SW8270D	N	Isophorone	ug/l	0.95	U		
SW8270D	N	N-Nitrosodi-n-propylamine	ug/l	0.95	U		
SW8270D	N	N-Nitrosodiphenylamine	ug/l	0.95	U		
SW8270D	N	Nitrobenzene	ug/l	0.95	U		
SW8270D	N	Pentachlorophenol	ug/l	4.8	U		
SW8270D	N	Phenanthrene	ug/l	0.19	U		
SW8270D	N	Phenol	ug/l	0.95	U		
SW8270D	N	Pyrene	ug/l	0.19	U		
SW6010	T	Chromium	ug/l	10	U		
SW6010	T	Sodium	ug/l	59000			
SW7196A	T	Chromium, Hexavalent	mg/l	0.005	U		
E300	N	Chloride	mg/l	110			
E300	N	Sulfate	mg/l	18			
E350.1	T	Ammonia	mg/l	0.25	U		
E353.2	T	Nitrate as N	mg/l	2.2			
E353.2	T	Nitrite as N	mg/l	0.1	U		

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
N = presumptively present
ug/l = microgram per liter
mg/l = milligram per liter
ng/l = nanogram per liter

Prepared by / Date: KMS 4/23/15
Checked by / Date: RTM 4/24/15

Table 3
Data Validation Action Summary
Data Validation Report
March 2015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab Sample Delivery Group	Analysis Method	Lab Sample ID	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Validation Reason Code	Result Units
240-48587-1	SW6010	240-48587-5	OC-M15L2C	Chromium	1.4	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-6	OC-M02L07	Chromium	1.2	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-8	OC-M14L2B	Chromium	1.5	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-9	OC-M24L65	Chromium	0.78	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-10	OC-M24L72A	Chromium	1.4	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-11	OC-M24L64	Chromium	1.2	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-13	OC-M24L63	Chromium	0.9	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-14	OC-M24L66	Chromium	0.7	J	10	U	BL1	ug/l
240-48587-1	SW6010	240-48587-15	OC-M24L54	Chromium	3.4	J	10	U	BL1	ug/l
240-48587-1	SW8270D	240-48587-5	OC-M15L2C	Benzoic Acid	24	U H	24	UJ	HT, LCS-L	ug/l
240-48587-1	SW8270D	240-48587-5	OC-M15L2C	Caprolactam	0.34	J B	4.8	U	BL1	ug/l
240-48587-1	SW8270D	240-48587-6	OC-M02L07	Benzoic Acid	24	U *		R	LCS-L	ug/l
240-48587-1	SW8270D	240-48587-6	OC-M02L07	Caprolactam	4.8	U	4.8	UJ	LCS-L	ug/l
240-48587-1	SW8270D	240-48587-11	OC-M24L64	Benzoic Acid	24	U H	24	UJ	HT, LCS-L	ug/l
240-48587-1	SW8270D	240-48587-11	OC-M24L64	Caprolactam	0.53	J B	4.8	U	BL1	ug/l
240-48587-1	SW8270D	240-48587-13	OC-M24L63	Benzoic Acid	24	U H	24	UJ	HT, LCS-L	ug/l
240-48587-1	SW8270D	240-48587-13	OC-M24L63	Caprolactam	0.22	J B	4.8	U	BL1	ug/l
240-48587-1	SW8270D	240-48587-15	OC-M24L54	Benzoic Acid	24	U H	24	UJ	HT, LCS-L	ug/l
240-48587-1	SW8270D	240-48587-15	OC-M24L54	Caprolactam	0.51	J B	4.8	U	BL1	ug/l
240-48587-1	SW8270D	240-48655-2	OC-M24L94	Aniline	4.8	U H	4.8	UJ	HT	ug/l
240-48587-1	SW8270D	240-48655-2	OC-M24L94	Benzo(ghi)perylene	0.19	U	0.19	UJ	CCV%D	ug/l
240-48587-1	SW8270D	240-48655-2	OC-M24L94	Benzoic Acid	24	U	24	UJ	LCS-L, LCS-RPD	ug/l
240-48587-1	SW8270D	240-48655-2	OC-M24L94	Caprolactam	0.38	J B	4.8	U	BL1	ug/l

Units:
- mg/l = milligram per liter
- ng/l = nanogram per liter
- ug/l = microgram per liter

Validation Qualifier:
- U = not detected, value is the reporting limit
- J = value is estimated
- R = Rejected result

Validation Reason Codes:
- BL1 = Method Blank Qualifier
- CCV%D = Continuing calibration percent difference exceeds goal
- HT = Holding time for prep or analysis exceeded
- LCS-L = LCS recovery low
- LCS-RPD = LCS-LCSD relative percent difference limit exceeded

Prepared by / Date: KMS 4/23/2015
Checked by / Date: RTM 4/24/2015

Table 4
Final Results Summary - Tentatively Identified Compounds
Data Validation Report
March 2015 Quarterly Residential Groundwater
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab SDG	Lab Sample ID	Analytical Method	Location	Sample ID	CAS Number	Chemical Name	TIC Retention Time	Result Value	Lab Qualifier	Final Qualifier	Result Unit	Dilution Factor	Refuse Flag
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	506-12-7	Heptadecanoic Acid	11.26	0.76	T J N	JN	ug/l	1	N
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	HLA0141	TIC PAH(s)	8.61	0.81	T H J	JN	ug/l	1	N
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	57-10-3	Hexadecanoic acid	10.54	0.94	T H J N	JN	ug/l	1	N
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	HLA0650	Unknown Hydrocarbons	9.21	0.95	T H J	JN	ug/l	1	N
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	HLA0058	TIC(s) Unspecified	4.78	1.1	T J	JN	ug/l	1	N
240-48587-1	240-48655-2	SW8270D	M-24/L-94	OC-M24L94	HLA0058	TIC(s) Unspecified	4.7	1.4	T H J	JN	ug/l	1	N
240-48587-1	240-48587-5	SW8270D	M-15/L-02C	OC-M15L2C	57-10-3	Hexadecanoic acid	10.54	1.4	T H J N	JN	ug/l	1	N
240-48587-1	240-48587-5	SW8270D	M-15/L-02C	OC-M15L2C	HLA0058	TIC(s) Unspecified	10.35	1.6	T H J	JN	ug/l	1	N
240-48587-1	240-48587-6	SW8270D	M-02/L-07E	OC-M02L07	HLA0058	TIC(s) Unspecified	7.01	1.0	T J	JN	ug/l	1	N
240-48587-1	240-48587-11	SW8270D	M-24/L-64	OC-M24L64	HLA0141	TIC PAH(s)	8.6	0.66	T H J	JN	ug/l	1	N
240-48587-1	240-48587-11	SW8270D	M-24/L-64	OC-M24L64	HLA0650	Unknown Hydrocarbons	9.21	0.69	T H J	JN	ug/l	1	N
240-48587-1	240-48587-11	SW8270D	M-24/L-64	OC-M24L64	57-10-3	Hexadecanoic acid	10.54	0.80	T H J N	JN	ug/l	1	N
240-48587-1	240-48587-13	SW8270D	M-24/L-63	OC-M24L63	HLA0650	Unknown Hydrocarbons	14.56	0.78	T H J	JN	ug/l	1	N
240-48587-1	240-48587-13	SW8270D	M-24/L-63	OC-M24L63	HLA0650	Unknown Hydrocarbons	9.21	0.79	T H J	JN	ug/l	1	N
240-48587-1	240-48587-13	SW8270D	M-24/L-63	OC-M24L63	57-10-3	Hexadecanoic acid	10.54	0.97	T H J N	JN	ug/l	1	N
240-48587-1	240-48587-15	SW8270D	M-24/L-54	OC-M24L54	HLA0650	Unknown Hydrocarbons	9.99	0.99	T H J	JN	ug/l	1	N
240-48587-1	240-48587-15	SW8270D	M-24/L-54	OC-M24L54	HLA0650	Unknown Hydrocarbons	10.35	1.0	T H J	JN	ug/l	1	N
240-48587-1	240-48587-15	SW8270D	M-24/L-54	OC-M24L54	HLA0650	Unknown Hydrocarbons	9.61	1.3	T H J	JN	ug/l	1	N
240-48587-1	240-48587-15	SW8270D	M-24/L-54	OC-M24L54	HLA0650	Unknown Hydrocarbons	9.22	1.6	T H J	JN	ug/l	1	N

Notes:
T = Tentatively identified compound, the result is estimated
J = value is estimated
N = Presumptively present
H = Sample was prepped or analyzed beyond the specified holding time
ug/l = microgram per liter

Prepared by / Date: KMS 4/23/15
Checked by / Date: RTM 4/24/15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-48587-1
Client Project/Site: Olin Wilmington Residential Well
Revision: 2

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
4/21/2015 3:21:00 PM
Sally Hoffman, Project Management Assistant I
(716)504-9839
sally.hoffman@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time
E	Result exceeded calibration range.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Job ID: 240-48587-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative
240-48587-1

Revision 2
This report has been revised to amend the sample identification for sample #9: OC-M24L65.

Revision 1
This report has been revised to include results and QC data for samples OC-M01L6D and OC-M24L94.

Receipt
The samples were received on 3/25/2015 10:00 AM and 3/26/2015 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.1° C and 4.3° C.

GC/MS Semi VOA
Method 8270D: With the exception of diluted samples and adjustments made for % solids or insufficient sample mass, per question G on the MassDEP Analytical Protocol Certification Form, TestAmerica's routine reporting limits do not achieve the CAM reporting limits specified in this CAM protocol for 3,3'-Dichlorobenzidine & 4-Chloroaniline.

Method 8270D: The continuing calibration verification (CCV) associated with analytical batch 174402 recovered above the upper control limit for benzo(ghi)perylene. The samples associated with this CCV were non-detects for this analyte; therefore, the data have been reported. The following samples are impacted: OC-M15L2C (240-48587-5), OC-M02L07 (240-48587-6), OC-M24L64 (240-48587-11), OC-M24L63 (240-48587-13), OC-M24L54 (240-48587-15) and (MB 240-173777/14-A).

Method 8270D: The continuing calibration verification (CCV) associated with analytical batch 174592 recovered above the upper control limit for 4-nitrophenol, indeno(1,2,3)pyrene, dibenz(a,h)anthracene, and benzo(ghi)perylene. The sample associated with this CCV was non-detect for the affected analytes; therefore, the data have been reported. The following sample is impacted: OC-M24L94 (240-48655-2).

Method 8270D: The laboratory control sample (LCS) for prep batch 173777 recovered below control limits for Benzoic acid. The associated samples,OC-M15L2C (240-48587-5), OC-M24L64 (240-48587-11), OC-M24L63 (240-48587-13) and OC-M24L54 (240-48587-15), were re-prepared and re-analyzed outside holding time with benzoic acid meeting recovery criteria. The initial results have been reported as has benzoic acid from the reextracted results.

Method GCMSMS_NDMA: Due to the level of spike added to the laboratory control sample (LCS) (prep batches 69743 and 69880, analytical batch 70283), analyte NDPA had recoveries above the calibration range. No action was taken, since all recoveries (analyte and surrogate) were within the control limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method 6010: At the request of the client, an abbreviated MCP compound list was reported for this job.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 7196A: The MS/MSD for the following sample recovered outside of the method-specified criteria of 85-115%: OC-M24L54 (240-48587-15). The sample was analyzed using Massachusetts MCP requirements, which allows a MS/MSD recovery range of 75-125%, so the MS/MSD data has not been flagged.

Method 7196A: The following samples had their analysis for hexavalent chromium sent to TestAmerica Westfield: OC-M15L2C

Job ID: 240-48587-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

(240-48587-5), OC-M02L07 (240-48587-6), OC-M14L2B (240-48587-8), OC-M24L64 (240-48587-11), OC-M24L63 (240-48587-13) and OC-M24L54 (240-48587-15). These samples were received on 3/25/2015 at 0800 and processed within holding time for the 7196A method requirements under MA MCP.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method 3510C: Sample 240-48587-6 was sent for rework due to low benzoic acid recovery. During the re-prep the KD glassware broke and the sample was lost. The original data will be reported. OC-M02L07 (240-48587-6)

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 69743 for method NDMA-aqueous.

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 69880 for method NDMA-aqueous.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **240-48587-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the data set for the following Laboratory Sample ID Number(s):

240-48587-1[1-15], 240-48655-1[1-2]

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [X]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [X]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9012 / 9014/ 4500CN Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[ ] Yes [X] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[ ] Yes [X] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: Position: Project Manager

Printed Name: Becky Mason Date: 4/14/15 10:09

This form has been electronically signed and approved

Method Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
GCMSMS_NDMA	Nitrosamines by Isotope Dilution and GC/CI/MS/MS	TestAmerica SOP	TAL SAC
300.0	Anions, Ion Chromatography	MCAWW	TAL SAV
6010	Metals (ICP)	SW846	TAL CAN
350.1	Nitrogen, Ammonia	MCAWW	TAL SAV
353.2	Nitrogen, Nitrite	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
7196A	Chromium, Hexavalent	SW846	TAL WFD

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-48587-1	OC-M03L07	Water	03/24/15 09:01	03/25/15 10:00
240-48587-2	OC-M03L02	Water	03/24/15 08:04	03/25/15 10:00
240-48587-3	OC-M03L2D	Water	03/24/15 08:23	03/25/15 10:00
240-48587-4	OC-M03L2F	Water	03/24/15 08:39	03/25/15 10:00
240-48587-5	OC-M15L2C	Water	03/24/15 09:27	03/25/15 10:00
240-48587-6	OC-M02L07	Water	03/24/15 11:11	03/25/15 10:00
240-48587-7	OC-M01L6C	Water	03/24/15 10:50	03/25/15 10:00
240-48587-8	OC-M14L2B	Water	03/24/15 10:28	03/25/15 10:00
240-48587-9	OC-M24L65	Water	03/24/15 13:12	03/25/15 10:00
240-48587-10	OC-M24L72A	Water	03/24/15 12:07	03/25/15 10:00
240-48587-11	OC-M24L64	Water	03/24/15 12:55	03/25/15 10:00
240-48587-12	OC-M24L116	Water	03/24/15 12:36	03/25/15 10:00
240-48587-13	OC-M24L63	Water	03/24/15 14:05	03/25/15 10:00
240-48587-14	OC-M24L66	Water	03/24/15 13:50	03/25/15 10:00
240-48587-15	OC-M24L54	Water	03/24/15 15:10	03/25/15 10:00
240-48655-1	OC-M01L6D	Water	03/25/15 12:11	03/26/15 10:30
240-48655-2	OC-M24L94	Water	03/25/15 12:36	03/26/15 10:30

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M03L07 — Lab Sample ID: 240-48587-1

No Detections.

Client Sample ID: OC-M03L02 — Lab Sample ID: 240-48587-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	18		1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M03L2D — Lab Sample ID: 240-48587-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	1.1	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M03L2F — Lab Sample ID: 240-48587-4

No Detections.

Client Sample ID: OC-M15L2C — Lab Sample ID: 240-48587-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.34	J B	4.8	0.19	ug/L	1		8270D	Total/NA
Chloride	110		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	27		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	1.4	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	21000		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	0.017	J	0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M02L07 — Lab Sample ID: 240-48587-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	21		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	16		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	1.2	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	8400		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	0.81		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M01L6C — Lab Sample ID: 240-48587-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	1.2	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M14L2B — Lab Sample ID: 240-48587-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	120		4.0	1.6	mg/L	4		300.0	Total/NA
Chromium	1.5	J	10	0.55	ug/L	1		6010	Total Recoverable

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M14L2B (Continued) — Lab Sample ID: 240-48587-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	37000		5000	180	ug/L	1		6010	Total Recoverable

Client Sample ID: OC-M24L65 — Lab Sample ID: 240-48587-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	100		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	18		2.0	0.80	mg/L	2		300.0	Total/NA
Chromium	0.78	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	16000		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	0.53		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L72A — Lab Sample ID: 240-48587-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	110		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	18		2.0	0.80	mg/L	2		300.0	Total/NA
Chromium	1.4	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	20000		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	0.48		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L64 — Lab Sample ID: 240-48587-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.53	J B	4.8	0.19	ug/L	1		8270D	Total/NA
Chloride	130		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	18		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	1.2	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	22000		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	0.49		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L116 — Lab Sample ID: 240-48587-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	1.2	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M24L63 — Lab Sample ID: 240-48587-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.22	J B	4.8	0.19	ug/L	1		8270D	Total/NA
Chloride	140		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	19		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.90	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	25000		5000	180	ug/L	1		6010	Total Recoverable

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L63 (Continued) — Lab Sample ID: 240-48587-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.53		0.050	0.010	mg/L	1		353.2	Total/NA

Client Sample ID: OC-M24L66 — Lab Sample ID: 240-48587-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	3.4		0.50	0.20	mg/L	1		300.0	Total/NA
Sulfate	8.4		1.0	0.40	mg/L	1		300.0	Total/NA
Chromium	0.70	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	2500	J	5000	180	ug/L	1		6010	Total Recoverable

Client Sample ID: OC-M24L54 — Lab Sample ID: 240-48587-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.51	J B	4.8	0.19	ug/L	1		8270D	Total/NA
N-Nitrosodimethylamine	10		1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	81		1.0	0.40	mg/L	2		300.0	Total/NA
Sulfate	24		2.0	0.80	mg/L	2		300.0	Total/NA
Chromium	3.4	J	10	0.55	ug/L	1		6010	Total Recoverable
Sodium	30000		5000	180	ug/L	1		6010	Total Recoverable

Client Sample ID: OC-M01L6D — Lab Sample ID: 240-48655-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	1.2	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

Client Sample ID: OC-M24L94 — Lab Sample ID: 240-48655-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	0.38	J B	4.8	0.19	ug/L	1		8270D	Total/NA
N-Nitrosodimethylamine	1.0	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA
Chloride	110		2.0	0.80	mg/L	4		300.0	Total/NA
Sulfate	18		1.0	0.40	mg/L	1		300.0	Total/NA
Sodium	59000		5000	180	ug/L	1		6010	Total Recoverable
Nitrate as N	2.2		0.10	0.020	mg/L	2		353.2	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M03L07
Date Collected: 03/24/15 09:01
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/30/15 11:03	04/03/15 16:11	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 16:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*36*		*25 - 150*	*03/30/15 11:03*	*04/03/15 16:11*	*1*
N-Nitrosodi-n-propylamine-d14	*89*		*25 - 150*	*03/30/15 11:03*	*04/03/15 16:11*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M03L02
Date Collected: 03/24/15 08:04
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-2
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/30/15 11:03	04/03/15 16:49	1
N-Nitrosodimethylamine	**18**		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 16:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*03/30/15 11:03*	*04/03/15 16:49*	*1*
N-Nitrosodi-n-propylamine-d14	*95*		*25 - 150*	*03/30/15 11:03*	*04/03/15 16:49*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M03L2D
Date Collected: 03/24/15 08:23
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-3
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/30/15 11:03	04/03/15 17:27	1
N-Nitrosodimethylamine	**1.1**	**J**	1.9	0.37	ng/L		03/30/15 11:03	04/03/15 17:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*03/30/15 11:03*	*04/03/15 17:27*	*1*
N-Nitrosodi-n-propylamine-d14	*98*		*25 - 150*	*03/30/15 11:03*	*04/03/15 17:27*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M03L2F
Date Collected: 03/24/15 08:39
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-4
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/30/15 11:03	04/03/15 18:05	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 18:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*35*		*25 - 150*	*03/30/15 11:03*	*04/03/15 18:05*	*1*
N-Nitrosodi-n-propylamine-d14	*78*		*25 - 150*	*03/30/15 11:03*	*04/03/15 18:05*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M15L2C
Date Collected: 03/24/15 09:27
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-5
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzaldehyde	ND		0.95	0.37	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/26/15 08:57	03/31/15 16:41	1
Fluorene	ND		0.19	0.039	ug/L		03/26/15 08:57	03/31/15 16:41	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/26/15 08:57	03/31/15 16:41	1
Carbazole	ND		0.95	0.27	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzyl alcohol	ND		4.8	0.36	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/26/15 08:57	03/31/15 16:41	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		03/26/15 08:57	03/31/15 16:41	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 16:41	1
Aniline	ND		4.8	0.32	ug/L		03/26/15 08:57	03/31/15 16:41	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 16:41	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 16:41	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Chlorophenol	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 16:41	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 16:41	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/26/15 08:57	03/31/15 16:41	1
Dibenzofuran	ND		0.95	0.019	ug/L		03/26/15 08:57	03/31/15 16:41	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/26/15 08:57	03/31/15 16:41	1
Chrysene	ND		0.19	0.048	ug/L		03/26/15 08:57	03/31/15 16:41	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/26/15 08:57	03/31/15 16:41	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		03/26/15 08:57	03/31/15 16:41	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/26/15 08:57	03/31/15 16:41	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 16:41	1
Azobenzene	ND		9.5	0.28	ug/L		03/26/15 08:57	03/31/15 16:41	1
Atrazine	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/26/15 08:57	03/31/15 16:41	1
Phenanthrene	ND		0.19	0.059	ug/L		03/26/15 08:57	03/31/15 16:41	1
Caprolactam	**0.34**	**J B**	4.8	0.19	ug/L		03/26/15 08:57	03/31/15 16:41	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 16:41	1
Fluoranthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 16:41	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Methylphenol	ND		0.95	0.16	ug/L		03/26/15 08:57	03/31/15 16:41	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		03/26/15 08:57	03/31/15 16:41	1
Pyrene	ND		0.19	0.040	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzoic acid	ND	*	24	9.5	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		03/26/15 08:57	03/31/15 16:41	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		03/26/15 08:57	03/31/15 16:41	1
Acenaphthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		03/26/15 08:57	03/31/15 16:41	1
Phenyl ether	ND		9.5	1.1	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		03/26/15 08:57	03/31/15 16:41	1

Client Sample ID: OC-M15L2C
Date Collected: 03/24/15 09:27
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-5
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 16:41	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/26/15 08:57	03/31/15 16:41	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 16:41	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/26/15 08:57	03/31/15 16:41	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 16:41	1
Isophorone	ND		0.95	0.26	ug/L		03/26/15 08:57	03/31/15 16:41	1
Phenol	ND		0.95	0.57	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		03/26/15 08:57	03/31/15 16:41	1
Diethyl phthalate	ND		1.9	0.57	ug/L		03/26/15 08:57	03/31/15 16:41	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/26/15 08:57	03/31/15 16:41	1
Nitrobenzene	ND		0.95	0.038	ug/L		03/26/15 08:57	03/31/15 16:41	1
Anthracene	ND		0.19	0.084	ug/L		03/26/15 08:57	03/31/15 16:41	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 16:41	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 16:41	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		03/26/15 08:57	03/31/15 16:41	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/26/15 08:57	03/31/15 16:41	1
Acetophenone	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 16:41	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 16:41	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		03/26/15 08:57	03/31/15 16:41	1
Hexachloroethane	ND		0.95	0.18	ug/L		03/26/15 08:57	03/31/15 16:41	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/26/15 08:57	03/31/15 16:41	1
Benzophenone	ND		4.8	4.8	ug/L		03/26/15 08:57	03/31/15 16:41	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.3*	*T J*	*ug/L*		*5.37*		*03/26/15 08:57*	*03/31/15 16:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*67*		*31 - 115*	*03/26/15 08:57*	*03/31/15 16:41*	*1*
2-Fluorobiphenyl (Surr)	*80*		*29 - 110*	*03/26/15 08:57*	*03/31/15 16:41*	*1*
2,4,6-Tribromophenol	*68*		*21 - 128*	*03/26/15 08:57*	*03/31/15 16:41*	*1*
Nitrobenzene-d5	*74*		*31 - 110*	*03/26/15 08:57*	*03/31/15 16:41*	*1*
Phenol-d5	*21*		*10 - 110*	*03/26/15 08:57*	*03/31/15 16:41*	*1*
2-Fluorophenol	*34*		*15 - 110*	*03/26/15 08:57*	*03/31/15 16:41*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND	H	24	9.5	ug/L		04/03/15 07:48	04/06/15 13:41	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown Hydrocarbon	*1.7*	*T H J*	*ug/L*		*7.35*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown	*1.4*	*T H J*	*ug/L*		*7.73*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown Hydrocarbon	*5.4*	*T H J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown Hydrocarbon	*4.2*	*T H J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown	*1.5*	*T H J*	*ug/L*		*8.62*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown Hydrocarbon	*2.5*	*T H J*	*ug/L*		*8.80*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown	*1.6*	*T H J*	*ug/L*		*10.35*		*04/03/15 07:48*	*04/06/15 13:41*	*1*
n-Hexadecanoic acid	*1.4*	*T H J N*	*ug/L*		*10.54*	*57-10-3*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
Unknown	*2.4*	*T H J*	*ug/L*		*11.14*		*04/03/15 07:48*	*04/06/15 13:41*	*1*

Client Sample ID: OC-M15L2C

Date Collected: 03/24/15 09:27
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-5

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Octadecanoic acid	*2.0*	*T H J N*	*ug/L*		*11.21*	*57-11-4*	*04/03/15 07:48*	*04/06/15 13:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*74*		*31 - 115*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
2-Fluorobiphenyl (Surr)	*79*		*29 - 110*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
2,4,6-Tribromophenol	*87*		*21 - 128*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
Nitrobenzene-d5	*70*		*31 - 110*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
Phenol-d5	*19*		*10 - 110*	*04/03/15 07:48*	*04/06/15 13:41*	*1*
2-Fluorophenol	*34*		*15 - 110*	*04/03/15 07:48*	*04/06/15 13:41*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/30/15 11:03	04/03/15 18:44	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 18:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*03/30/15 11:03*	*04/03/15 18:44*	*1*
N-Nitrosodi-n-propylamine-d14	*84*		*25 - 150*	*03/30/15 11:03*	*04/03/15 18:44*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		2.0	0.80	mg/L			03/26/15 15:28	4
Sulfate	**27**		1.0	0.40	mg/L			03/26/15 15:13	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**1.4**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 08:52	1
Sodium	**21000**		5000	180	ug/L		03/26/15 10:00	03/27/15 08:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:32	1
Nitrate as N	**0.017**	**J**	0.050	0.010	mg/L			03/25/15 18:08	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M02L07
Date Collected: 03/24/15 11:11
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-6
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzaldehyde	ND		0.96	0.37	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/26/15 08:57	03/31/15 17:07	1
Fluorene	ND		0.19	0.039	ug/L		03/26/15 08:57	03/31/15 17:07	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/26/15 08:57	03/31/15 17:07	1
Carbazole	ND		0.96	0.27	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzyl alcohol	ND		4.8	0.37	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/26/15 08:57	03/31/15 17:07	1
3 & 4 Methylphenol	ND		1.9	0.77	ug/L		03/26/15 08:57	03/31/15 17:07	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:07	1
Aniline	ND		4.8	0.33	ug/L		03/26/15 08:57	03/31/15 17:07	1
Bis(2-chloroethoxy)methane	ND		0.96	0.31	ug/L		03/26/15 08:57	03/31/15 17:07	1
N-Nitrosodiphenylamine	ND		0.96	0.30	ug/L		03/26/15 08:57	03/31/15 17:07	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Chlorophenol	ND		0.96	0.28	ug/L		03/26/15 08:57	03/31/15 17:07	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:07	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/26/15 08:57	03/31/15 17:07	1
Dibenzofuran	ND		0.96	0.019	ug/L		03/26/15 08:57	03/31/15 17:07	1
Hexachlorocyclopentadiene	ND		9.6	0.23	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/26/15 08:57	03/31/15 17:07	1
Chrysene	ND		0.19	0.048	ug/L		03/26/15 08:57	03/31/15 17:07	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/26/15 08:57	03/31/15 17:07	1
1,2,4,5-Tetrachlorobenzene	ND		0.96	0.53	ug/L		03/26/15 08:57	03/31/15 17:07	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/26/15 08:57	03/31/15 17:07	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:07	1
Azobenzene	ND		9.6	0.28	ug/L		03/26/15 08:57	03/31/15 17:07	1
Atrazine	ND		0.96	0.33	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzo[g,h,i]perylene	ND		0.19	0.045	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/26/15 08:57	03/31/15 17:07	1
Phenanthrene	ND		0.19	0.060	ug/L		03/26/15 08:57	03/31/15 17:07	1
Caprolactam	ND		4.8	0.19	ug/L		03/26/15 08:57	03/31/15 17:07	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:07	1
Fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:07	1
1,1'-Biphenyl	ND		0.96	0.13	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Methylphenol	ND		0.96	0.16	ug/L		03/26/15 08:57	03/31/15 17:07	1
N-Nitrosodi-n-propylamine	ND		0.96	0.23	ug/L		03/26/15 08:57	03/31/15 17:07	1
Pyrene	ND		0.19	0.040	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzoic acid	ND	*	24	9.6	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Methylnaphthalene	ND		0.19	0.087	ug/L		03/26/15 08:57	03/31/15 17:07	1
Hexachlorobenzene	ND		0.19	0.082	ug/L		03/26/15 08:57	03/31/15 17:07	1
Acenaphthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,2'-oxybis[1-chloropropane]	ND		0.96	0.38	ug/L		03/26/15 08:57	03/31/15 17:07	1
Phenyl ether	ND		9.6	1.2	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,3,4,6-Tetrachlorophenol	ND		9.6	0.56	ug/L		03/26/15 08:57	03/31/15 17:07	1

Client Sample ID: OC-M02L07
Date Collected: 03/24/15 11:11
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-6
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:07	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/26/15 08:57	03/31/15 17:07	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:07	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/26/15 08:57	03/31/15 17:07	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:07	1
Isophorone	ND		0.96	0.26	ug/L		03/26/15 08:57	03/31/15 17:07	1
Phenol	ND		0.96	0.58	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,6-Dinitrotoluene	ND		4.8	0.77	ug/L		03/26/15 08:57	03/31/15 17:07	1
Diethyl phthalate	ND		1.9	0.58	ug/L		03/26/15 08:57	03/31/15 17:07	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/26/15 08:57	03/31/15 17:07	1
Nitrobenzene	ND		0.96	0.038	ug/L		03/26/15 08:57	03/31/15 17:07	1
Anthracene	ND		0.19	0.085	ug/L		03/26/15 08:57	03/31/15 17:07	1
Bis(2-chloroethyl)ether	ND		0.96	0.096	ug/L		03/26/15 08:57	03/31/15 17:07	1
2-Chloronaphthalene	ND		0.96	0.096	ug/L		03/26/15 08:57	03/31/15 17:07	1
2,4-Dinitrophenol	ND		4.8	0.31	ug/L		03/26/15 08:57	03/31/15 17:07	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/26/15 08:57	03/31/15 17:07	1
Acetophenone	ND		0.96	0.33	ug/L		03/26/15 08:57	03/31/15 17:07	1
1,2-Dichlorobenzene	ND		0.96	0.28	ug/L		03/26/15 08:57	03/31/15 17:07	1
3,3'-Dichlorobenzidine	ND		4.8	0.36	ug/L		03/26/15 08:57	03/31/15 17:07	1
Hexachloroethane	ND		0.96	0.18	ug/L		03/26/15 08:57	03/31/15 17:07	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/26/15 08:57	03/31/15 17:07	1
Benzophenone	ND		4.8	4.8	ug/L		03/26/15 08:57	03/31/15 17:07	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.0*	*T J*	*ug/L*		*7.01*		*03/26/15 08:57*	*03/31/15 17:07*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*65*		*31 - 115*	*03/26/15 08:57*	*03/31/15 17:07*	*1*
2-Fluorobiphenyl (Surr)	*81*		*29 - 110*	*03/26/15 08:57*	*03/31/15 17:07*	*1*
2,4,6-Tribromophenol	*71*		*21 - 128*	*03/26/15 08:57*	*03/31/15 17:07*	*1*
Nitrobenzene-d5	*75*		*31 - 110*	*03/26/15 08:57*	*03/31/15 17:07*	*1*
Phenol-d5	*19*		*10 - 110*	*03/26/15 08:57*	*03/31/15 17:07*	*1*
2-Fluorophenol	*32*		*15 - 110*	*03/26/15 08:57*	*03/31/15 17:07*	*1*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/30/15 11:03	04/03/15 19:22	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 19:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*36*		*25 - 150*	*03/30/15 11:03*	*04/03/15 19:22*	*1*
N-Nitrosodi-n-propylamine-d14	*73*		*25 - 150*	*03/30/15 11:03*	*04/03/15 19:22*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**21**		0.50	0.20	mg/L			03/26/15 15:44	1
Sulfate	**16**		1.0	0.40	mg/L			03/26/15 15:44	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M02L07
Date Collected: 03/24/15 11:11
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-6
Matrix: Water

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**1.2**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:23	1
Sodium	**8400**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:32	1
Nitrate as N	**0.81**		0.050	0.010	mg/L			03/25/15 18:14	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:14	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M01L6C
Date Collected: 03/24/15 10:50
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-7
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/30/15 11:03	04/03/15 20:00	1
N-Nitrosodimethylamine	**1.2**	**J**	1.9	0.37	ng/L		03/30/15 11:03	04/03/15 20:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*03/30/15 11:03*	*04/03/15 20:00*	*1*
N-Nitrosodi-n-propylamine-d14	*89*		*25 - 150*	*03/30/15 11:03*	*04/03/15 20:00*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M14L2B
Date Collected: 03/24/15 10:28
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-8
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/30/15 11:03	04/03/15 20:38	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 20:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*35*		*25 - 150*	*03/30/15 11:03*	*04/03/15 20:38*	*1*
N-Nitrosodi-n-propylamine-d14	*86*		*25 - 150*	*03/30/15 11:03*	*04/03/15 20:38*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**15**		0.50	0.20	mg/L			03/26/15 15:59	1
Sulfate	**120**		4.0	1.6	mg/L			03/27/15 12:26	4

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**1.5**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:27	1
Sodium	**37000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	ND		0.050	0.010	mg/L			03/25/15 18:16	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:16	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L65
Date Collected: 03/24/15 13:12
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-9
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/30/15 11:03	04/03/15 21:16	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/30/15 11:03	04/03/15 21:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*39*		*25 - 150*	*03/30/15 11:03*	*04/03/15 21:16*	*1*
N-Nitrosodi-n-propylamine-d14	*71*		*25 - 150*	*03/30/15 11:03*	*04/03/15 21:16*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**100**		2.0	0.80	mg/L			03/27/15 12:42	4
Sulfate	**18**		2.0	0.80	mg/L			03/26/15 16:14	2

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.78**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:32	1
Sodium	**16000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	**0.53**		0.050	0.010	mg/L			03/25/15 18:18	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:18	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L72A
Date Collected: 03/24/15 12:07
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-10
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/31/15 11:25	04/07/15 11:59	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/31/15 11:25	04/07/15 11:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*48*		*25 - 150*	*03/31/15 11:25*	*04/07/15 11:59*	*1*
N-Nitrosodi-n-propylamine-d14	*108*		*25 - 150*	*03/31/15 11:25*	*04/07/15 11:59*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		2.0	0.80	mg/L			03/27/15 12:57	4
Sulfate	**18**		2.0	0.80	mg/L			03/26/15 16:30	2

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**1.4**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:36	1
Sodium	**20000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	**0.48**		0.050	0.010	mg/L			03/25/15 18:19	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:19	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L64
Date Collected: 03/24/15 12:55
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-11
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzaldehyde	ND		0.95	0.37	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/26/15 08:57	03/31/15 17:32	1
Fluorene	ND		0.19	0.039	ug/L		03/26/15 08:57	03/31/15 17:32	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/26/15 08:57	03/31/15 17:32	1
Carbazole	ND		0.95	0.27	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzyl alcohol	ND		4.8	0.36	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/26/15 08:57	03/31/15 17:32	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		03/26/15 08:57	03/31/15 17:32	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:32	1
Aniline	ND		4.8	0.32	ug/L		03/26/15 08:57	03/31/15 17:32	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 17:32	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 17:32	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Chlorophenol	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 17:32	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:32	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/26/15 08:57	03/31/15 17:32	1
Dibenzofuran	ND		0.95	0.019	ug/L		03/26/15 08:57	03/31/15 17:32	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/26/15 08:57	03/31/15 17:32	1
Chrysene	ND		0.19	0.048	ug/L		03/26/15 08:57	03/31/15 17:32	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/26/15 08:57	03/31/15 17:32	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		03/26/15 08:57	03/31/15 17:32	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/26/15 08:57	03/31/15 17:32	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:32	1
Azobenzene	ND		9.5	0.28	ug/L		03/26/15 08:57	03/31/15 17:32	1
Atrazine	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/26/15 08:57	03/31/15 17:32	1
Phenanthrene	ND		0.19	0.059	ug/L		03/26/15 08:57	03/31/15 17:32	1
Caprolactam	**0.53**	**J B**	4.8	0.19	ug/L		03/26/15 08:57	03/31/15 17:32	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:32	1
Fluoranthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:32	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Methylphenol	ND		0.95	0.16	ug/L		03/26/15 08:57	03/31/15 17:32	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		03/26/15 08:57	03/31/15 17:32	1
Pyrene	ND		0.19	0.040	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzoic acid	ND	*	24	9.5	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		03/26/15 08:57	03/31/15 17:32	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		03/26/15 08:57	03/31/15 17:32	1
Acenaphthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		03/26/15 08:57	03/31/15 17:32	1
Phenyl ether	ND		9.5	1.1	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		03/26/15 08:57	03/31/15 17:32	1

Client Sample ID: OC-M24L64
Date Collected: 03/24/15 12:55
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-11
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:32	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/26/15 08:57	03/31/15 17:32	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:32	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/26/15 08:57	03/31/15 17:32	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:32	1
Isophorone	ND		0.95	0.26	ug/L		03/26/15 08:57	03/31/15 17:32	1
Phenol	ND		0.95	0.57	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		03/26/15 08:57	03/31/15 17:32	1
Diethyl phthalate	ND		1.9	0.57	ug/L		03/26/15 08:57	03/31/15 17:32	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/26/15 08:57	03/31/15 17:32	1
Nitrobenzene	ND		0.95	0.038	ug/L		03/26/15 08:57	03/31/15 17:32	1
Anthracene	ND		0.19	0.084	ug/L		03/26/15 08:57	03/31/15 17:32	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 17:32	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 17:32	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		03/26/15 08:57	03/31/15 17:32	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/26/15 08:57	03/31/15 17:32	1
Acetophenone	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 17:32	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 17:32	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		03/26/15 08:57	03/31/15 17:32	1
Hexachloroethane	ND		0.95	0.18	ug/L		03/26/15 08:57	03/31/15 17:32	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/26/15 08:57	03/31/15 17:32	1
Benzophenone	ND		4.8	4.8	ug/L		03/26/15 08:57	03/31/15 17:32	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*03/26/15 08:57*	*03/31/15 17:32*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*68*		*31 - 115*	*03/26/15 08:57*	*03/31/15 17:32*	*1*
2-Fluorobiphenyl (Surr)	*74*		*29 - 110*	*03/26/15 08:57*	*03/31/15 17:32*	*1*
2,4,6-Tribromophenol	*74*		*21 - 128*	*03/26/15 08:57*	*03/31/15 17:32*	*1*
Nitrobenzene-d5	*74*		*31 - 110*	*03/26/15 08:57*	*03/31/15 17:32*	*1*
Phenol-d5	*20*		*10 - 110*	*03/26/15 08:57*	*03/31/15 17:32*	*1*
2-Fluorophenol	*35*		*15 - 110*	*03/26/15 08:57*	*03/31/15 17:32*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND	H	24	9.5	ug/L		04/03/15 07:48	04/06/15 14:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown Hydrocarbon	*1.3*	*T H J*	*ug/L*		*7.35*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown Hydrocarbon	*4.2*	*T H J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown Hydrocarbon	*3.2*	*T H J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown PAH	*0.66*	*T H J*	*ug/L*		*8.60*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown	*1.4*	*T H J*	*ug/L*		*8.62*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown Hydrocarbon	*1.4*	*T H J*	*ug/L*		*8.80*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown Hydrocarbon	*0.69*	*T H J*	*ug/L*		*9.21*		*04/03/15 07:48*	*04/06/15 14:06*	*1*
n-Hexadecanoic acid	*0.80*	*T H J N*	*ug/L*		*10.54*	*57-10-3*	*04/03/15 07:48*	*04/06/15 14:06*	*1*
Unknown	*1.3*	*T H J*	*ug/L*		*11.14*		*04/03/15 07:48*	*04/06/15 14:06*	*1*

Client Sample ID: OC-M24L64
Date Collected: 03/24/15 12:55
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-11
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Octadecanoic acid	0.86	T H J N	ug/L		11.20	57-11-4	04/03/15 07:48	04/06/15 14:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	67		31 - 115	04/03/15 07:48	04/06/15 14:06	1
2-Fluorobiphenyl (Surr)	61		29 - 110	04/03/15 07:48	04/06/15 14:06	1
2,4,6-Tribromophenol	63		21 - 128	04/03/15 07:48	04/06/15 14:06	1
Nitrobenzene-d5	56		31 - 110	04/03/15 07:48	04/06/15 14:06	1
Phenol-d5	14		10 - 110	04/03/15 07:48	04/06/15 14:06	1
2-Fluorophenol	23		15 - 110	04/03/15 07:48	04/06/15 14:06	1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/31/15 11:25	04/07/15 12:37	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/31/15 11:25	04/07/15 12:37	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
N-Nitrosodimethylamine-d6	39		25 - 150	03/31/15 11:25	04/07/15 12:37	1
N-Nitrosodi-n-propylamine-d14	104		25 - 150	03/31/15 11:25	04/07/15 12:37	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		2.0	0.80	mg/L			03/26/15 17:01	4
Sulfate	**18**		1.0	0.40	mg/L			03/26/15 16:45	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**1.2**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:40	1
Sodium	**22000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	**0.49**		0.050	0.010	mg/L			03/25/15 18:20	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L116
Date Collected: 03/24/15 12:36
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-12
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/31/15 11:25	04/07/15 13:16	1
N-Nitrosodimethylamine	**1.2**	**J**	1.9	0.37	ng/L		03/31/15 11:25	04/07/15 13:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*44*		*25 - 150*	*03/31/15 11:25*	*04/07/15 13:16*	*1*
N-Nitrosodi-n-propylamine-d14	*121*		*25 - 150*	*03/31/15 11:25*	*04/07/15 13:16*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L63
Date Collected: 03/24/15 14:05
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzaldehyde	ND		0.95	0.37	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/26/15 08:57	03/31/15 17:58	1
Fluorene	ND		0.19	0.039	ug/L		03/26/15 08:57	03/31/15 17:58	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/26/15 08:57	03/31/15 17:58	1
Carbazole	ND		0.95	0.27	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzyl alcohol	ND		4.8	0.36	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/26/15 08:57	03/31/15 17:58	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		03/26/15 08:57	03/31/15 17:58	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:58	1
Aniline	ND		4.8	0.32	ug/L		03/26/15 08:57	03/31/15 17:58	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 17:58	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 17:58	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Chlorophenol	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 17:58	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:58	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/26/15 08:57	03/31/15 17:58	1
Dibenzofuran	ND		0.95	0.019	ug/L		03/26/15 08:57	03/31/15 17:58	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/26/15 08:57	03/31/15 17:58	1
Chrysene	ND		0.19	0.048	ug/L		03/26/15 08:57	03/31/15 17:58	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/26/15 08:57	03/31/15 17:58	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		03/26/15 08:57	03/31/15 17:58	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/26/15 08:57	03/31/15 17:58	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 17:58	1
Azobenzene	ND		9.5	0.28	ug/L		03/26/15 08:57	03/31/15 17:58	1
Atrazine	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/26/15 08:57	03/31/15 17:58	1
Phenanthrene	ND		0.19	0.059	ug/L		03/26/15 08:57	03/31/15 17:58	1
Caprolactam	**0.22**	**J B**	4.8	0.19	ug/L		03/26/15 08:57	03/31/15 17:58	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 17:58	1
Fluoranthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:58	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Methylphenol	ND		0.95	0.16	ug/L		03/26/15 08:57	03/31/15 17:58	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		03/26/15 08:57	03/31/15 17:58	1
Pyrene	ND		0.19	0.040	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzoic acid	ND	*	24	9.5	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		03/26/15 08:57	03/31/15 17:58	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		03/26/15 08:57	03/31/15 17:58	1
Acenaphthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		03/26/15 08:57	03/31/15 17:58	1
Phenyl ether	ND		9.5	1.1	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		03/26/15 08:57	03/31/15 17:58	1

Client Sample ID: OC-M24L63
Date Collected: 03/24/15 14:05
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 17:58	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/26/15 08:57	03/31/15 17:58	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:58	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/26/15 08:57	03/31/15 17:58	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 17:58	1
Isophorone	ND		0.95	0.26	ug/L		03/26/15 08:57	03/31/15 17:58	1
Phenol	ND		0.95	0.57	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		03/26/15 08:57	03/31/15 17:58	1
Diethyl phthalate	ND		1.9	0.57	ug/L		03/26/15 08:57	03/31/15 17:58	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/26/15 08:57	03/31/15 17:58	1
Nitrobenzene	ND		0.95	0.038	ug/L		03/26/15 08:57	03/31/15 17:58	1
Anthracene	ND		0.19	0.084	ug/L		03/26/15 08:57	03/31/15 17:58	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 17:58	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 17:58	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		03/26/15 08:57	03/31/15 17:58	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/26/15 08:57	03/31/15 17:58	1
Acetophenone	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 17:58	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 17:58	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		03/26/15 08:57	03/31/15 17:58	1
Hexachloroethane	ND		0.95	0.18	ug/L		03/26/15 08:57	03/31/15 17:58	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/26/15 08:57	03/31/15 17:58	1
Benzophenone	ND		4.8	4.8	ug/L		03/26/15 08:57	03/31/15 17:58	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*03/26/15 08:57*	*03/31/15 17:58*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*63*		*31 - 115*	*03/26/15 08:57*	*03/31/15 17:58*	*1*
2-Fluorobiphenyl (Surr)	*71*		*29 - 110*	*03/26/15 08:57*	*03/31/15 17:58*	*1*
2,4,6-Tribromophenol	*70*		*21 - 128*	*03/26/15 08:57*	*03/31/15 17:58*	*1*
Nitrobenzene-d5	*66*		*31 - 110*	*03/26/15 08:57*	*03/31/15 17:58*	*1*
Phenol-d5	*18*		*10 - 110*	*03/26/15 08:57*	*03/31/15 17:58*	*1*
2-Fluorophenol	*29*		*15 - 110*	*03/26/15 08:57*	*03/31/15 17:58*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND	H	24	9.5	ug/L		04/03/15 07:48	04/06/15 14:32	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown Hydrocarbon	*1.4*	*T H J*	*ug/L*		*7.36*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown Hydrocarbon	*4.2*	*T H J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown Hydrocarbon	*3.5*	*T H J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown	*1.4*	*T H J*	*ug/L*		*8.63*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown Hydrocarbon	*1.6*	*T H J*	*ug/L*		*8.79*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown Hydrocarbon	*0.79*	*T H J*	*ug/L*		*9.21*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
n-Hexadecanoic acid	*0.97*	*T H J N*	*ug/L*		*10.54*	*57-10-3*	*04/03/15 07:48*	*04/06/15 14:32*	*1*
Unknown	*1.5*	*T H J*	*ug/L*		*11.14*		*04/03/15 07:48*	*04/06/15 14:32*	*1*
Octadecanoic acid	*1.0*	*T H J N*	*ug/L*		*11.20*	*57-11-4*	*04/03/15 07:48*	*04/06/15 14:32*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L63
Date Collected: 03/24/15 14:05
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown Hydrocarbon	0.78	T H J	ug/L		14.56		04/03/15 07:48	04/06/15 14:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	74		31 - 115	04/03/15 07:48	04/06/15 14:32	1
2-Fluorobiphenyl (Surr)	76		29 - 110	04/03/15 07:48	04/06/15 14:32	1
2,4,6-Tribromophenol	86		21 - 128	04/03/15 07:48	04/06/15 14:32	1
Nitrobenzene-d5	66		31 - 110	04/03/15 07:48	04/06/15 14:32	1
Phenol-d5	20		10 - 110	04/03/15 07:48	04/06/15 14:32	1
2-Fluorophenol	33		15 - 110	04/03/15 07:48	04/06/15 14:32	1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/31/15 11:25	04/07/15 13:54	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/31/15 11:25	04/07/15 13:54	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
N-Nitrosodimethylamine-d6	41		25 - 150	03/31/15 11:25	04/07/15 13:54	1
N-Nitrosodi-n-propylamine-d14	110		25 - 150	03/31/15 11:25	04/07/15 13:54	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**		2.0	0.80	mg/L			03/26/15 18:33	4
Sulfate	**19**		1.0	0.40	mg/L			03/26/15 18:18	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.90**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:44	1
Sodium	**25000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	**0.53**		0.050	0.010	mg/L			03/25/15 18:21	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L66
Date Collected: 03/24/15 13:50
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-14
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/31/15 11:25	04/07/15 17:59	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/31/15 11:25	04/07/15 17:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*03/31/15 11:25*	*04/07/15 17:59*	*1*
N-Nitrosodi-n-propylamine-d14	*95*		*25 - 150*	*03/31/15 11:25*	*04/07/15 17:59*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**3.4**		0.50	0.20	mg/L			03/26/15 18:48	1
Sulfate	**8.4**		1.0	0.40	mg/L			03/26/15 18:48	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.70**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:48	1
Sodium	**2500**	**J**	5000	180	ug/L		03/26/15 10:00	03/27/15 09:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	ND		0.050	0.010	mg/L			03/25/15 18:22	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:22	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L54
Date Collected: 03/24/15 15:10
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-15
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzaldehyde	ND		0.95	0.37	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/26/15 08:57	03/31/15 18:23	1
Fluorene	ND		0.19	0.039	ug/L		03/26/15 08:57	03/31/15 18:23	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/26/15 08:57	03/31/15 18:23	1
Carbazole	ND		0.95	0.27	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzyl alcohol	ND		4.8	0.36	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/26/15 08:57	03/31/15 18:23	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		03/26/15 08:57	03/31/15 18:23	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 18:23	1
Aniline	ND		4.8	0.32	ug/L		03/26/15 08:57	03/31/15 18:23	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 18:23	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		03/26/15 08:57	03/31/15 18:23	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Chlorophenol	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 18:23	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 18:23	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/26/15 08:57	03/31/15 18:23	1
Dibenzofuran	ND		0.95	0.019	ug/L		03/26/15 08:57	03/31/15 18:23	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/26/15 08:57	03/31/15 18:23	1
Chrysene	ND		0.19	0.048	ug/L		03/26/15 08:57	03/31/15 18:23	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/26/15 08:57	03/31/15 18:23	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		03/26/15 08:57	03/31/15 18:23	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/26/15 08:57	03/31/15 18:23	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/26/15 08:57	03/31/15 18:23	1
Azobenzene	ND		9.5	0.28	ug/L		03/26/15 08:57	03/31/15 18:23	1
Atrazine	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/26/15 08:57	03/31/15 18:23	1
Phenanthrene	ND		0.19	0.059	ug/L		03/26/15 08:57	03/31/15 18:23	1
Caprolactam	**0.51**	**J B**	4.8	0.19	ug/L		03/26/15 08:57	03/31/15 18:23	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/26/15 08:57	03/31/15 18:23	1
Fluoranthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 18:23	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Methylphenol	ND		0.95	0.16	ug/L		03/26/15 08:57	03/31/15 18:23	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		03/26/15 08:57	03/31/15 18:23	1
Pyrene	ND		0.19	0.040	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzoic acid	ND	*	24	9.5	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		03/26/15 08:57	03/31/15 18:23	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		03/26/15 08:57	03/31/15 18:23	1
Acenaphthene	ND		0.19	0.042	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		03/26/15 08:57	03/31/15 18:23	1
Phenyl ether	ND		9.5	1.1	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		03/26/15 08:57	03/31/15 18:23	1

Client Sample ID: OC-M24L54
Date Collected: 03/24/15 15:10
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-15
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/26/15 08:57	03/31/15 18:23	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/26/15 08:57	03/31/15 18:23	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 18:23	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/26/15 08:57	03/31/15 18:23	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/26/15 08:57	03/31/15 18:23	1
Isophorone	ND		0.95	0.26	ug/L		03/26/15 08:57	03/31/15 18:23	1
Phenol	ND		0.95	0.57	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		03/26/15 08:57	03/31/15 18:23	1
Diethyl phthalate	ND		1.9	0.57	ug/L		03/26/15 08:57	03/31/15 18:23	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/26/15 08:57	03/31/15 18:23	1
Nitrobenzene	ND		0.95	0.038	ug/L		03/26/15 08:57	03/31/15 18:23	1
Anthracene	ND		0.19	0.084	ug/L		03/26/15 08:57	03/31/15 18:23	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 18:23	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		03/26/15 08:57	03/31/15 18:23	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		03/26/15 08:57	03/31/15 18:23	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/26/15 08:57	03/31/15 18:23	1
Acetophenone	ND		0.95	0.32	ug/L		03/26/15 08:57	03/31/15 18:23	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		03/26/15 08:57	03/31/15 18:23	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		03/26/15 08:57	03/31/15 18:23	1
Hexachloroethane	ND		0.95	0.18	ug/L		03/26/15 08:57	03/31/15 18:23	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/26/15 08:57	03/31/15 18:23	1
Benzophenone	ND		4.8	4.8	ug/L		03/26/15 08:57	03/31/15 18:23	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*				*03/26/15 08:57*	*03/31/15 18:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*65*		*31 - 115*	*03/26/15 08:57*	*03/31/15 18:23*	*1*
2-Fluorobiphenyl (Surr)	*76*		*29 - 110*	*03/26/15 08:57*	*03/31/15 18:23*	*1*
2,4,6-Tribromophenol	*71*		*21 - 128*	*03/26/15 08:57*	*03/31/15 18:23*	*1*
Nitrobenzene-d5	*74*		*31 - 110*	*03/26/15 08:57*	*03/31/15 18:23*	*1*
Phenol-d5	*21*		*10 - 110*	*03/26/15 08:57*	*03/31/15 18:23*	*1*
2-Fluorophenol	*36*		*15 - 110*	*03/26/15 08:57*	*03/31/15 18:23*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND	H	24	9.5	ug/L		04/03/15 07:48	04/06/15 14:57	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown Hydrocarbon	*1.5*	*T H J*	*ug/L*		*7.35*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*4.4*	*T H J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*3.6*	*T H J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown PAH	*1.5*	*T H J*	*ug/L*		*8.62*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*2.1*	*T H J*	*ug/L*		*8.80*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*1.6*	*T H J*	*ug/L*		*9.22*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*1.3*	*T H J*	*ug/L*		*9.61*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*0.99*	*T H J*	*ug/L*		*9.99*		*04/03/15 07:48*	*04/06/15 14:57*	*1*
Unknown Hydrocarbon	*1.0*	*T H J*	*ug/L*		*10.35*		*04/03/15 07:48*	*04/06/15 14:57*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L54
Date Collected: 03/24/15 15:10
Date Received: 03/25/15 10:00

Lab Sample ID: 240-48587-15
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	1.2	T H J	ug/L		11.14		04/03/15 07:48	04/06/15 14:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	73		31 - 115	04/03/15 07:48	04/06/15 14:57	1
2-Fluorobiphenyl (Surr)	73		29 - 110	04/03/15 07:48	04/06/15 14:57	1
2,4,6-Tribromophenol	71		21 - 128	04/03/15 07:48	04/06/15 14:57	1
Nitrobenzene-d5	68		31 - 110	04/03/15 07:48	04/06/15 14:57	1
Phenol-d5	22		10 - 110	04/03/15 07:48	04/06/15 14:57	1
2-Fluorophenol	31		15 - 110	04/03/15 07:48	04/06/15 14:57	1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/31/15 11:25	04/07/15 18:37	1
N-Nitrosodimethylamine	**10**		1.9	0.37	ng/L		03/31/15 11:25	04/07/15 18:37	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
N-Nitrosodimethylamine-d6	42		25 - 150	03/31/15 11:25	04/07/15 18:37	1
N-Nitrosodi-n-propylamine-d14	106		25 - 150	03/31/15 11:25	04/07/15 18:37	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**81**		1.0	0.40	mg/L			03/26/15 19:04	2
Sulfate	**24**		2.0	0.80	mg/L			03/26/15 19:04	2

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**3.4**	**J**	10	0.55	ug/L		03/26/15 10:00	03/27/15 09:52	1
Sodium	**30000**		5000	180	ug/L		03/26/15 10:00	03/27/15 09:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 15:41	1
Nitrate as N	ND		0.050	0.010	mg/L			03/25/15 18:24	1
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M01L6D
Date Collected: 03/25/15 12:11
Date Received: 03/26/15 10:30

Lab Sample ID: 240-48655-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/31/15 11:25	04/03/15 23:11	1
N-Nitrosodimethylamine	**1.2**	**J**	1.9	0.37	ng/L		03/31/15 11:25	04/03/15 23:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*40*		*25 - 150*	*03/31/15 11:25*	*04/03/15 23:11*	*1*
N-Nitrosodi-n-propylamine-d14	*86*		*25 - 150*	*03/31/15 11:25*	*04/03/15 23:11*	*1*

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L94
Date Collected: 03/25/15 12:36
Date Received: 03/26/15 10:30

Lab Sample ID: 240-48655-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.19	0.042	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Nitrophenol	ND		1.9	0.27	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzaldehyde	ND		0.95	0.37	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4-Dimethylphenol	ND		1.9	0.24	ug/L		03/31/15 08:42	04/01/15 17:28	1
Fluorene	ND		0.19	0.039	ug/L		03/31/15 08:42	04/01/15 17:28	1
Di-n-octyl phthalate	ND		1.9	0.22	ug/L		03/31/15 08:42	04/01/15 17:28	1
Carbazole	ND		0.95	0.27	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzyl alcohol	ND		4.8	0.36	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzo[a]pyrene	ND		0.19	0.049	ug/L		03/31/15 08:42	04/01/15 17:28	1
3 & 4 Methylphenol	ND		1.9	0.76	ug/L		03/31/15 08:42	04/01/15 17:28	1
4-Nitroaniline	ND		1.9	0.21	ug/L		03/31/15 08:42	04/01/15 17:28	1
Aniline	ND	*	4.8	0.32	ug/L		03/31/15 08:42	04/01/15 17:28	1
Bis(2-chloroethoxy)methane	ND		0.95	0.30	ug/L		03/31/15 08:42	04/01/15 17:28	1
N-Nitrosodiphenylamine	ND		0.95	0.30	ug/L		03/31/15 08:42	04/01/15 17:28	1
Acenaphthylene	ND		0.19	0.046	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Chlorophenol	ND		0.95	0.28	ug/L		03/31/15 08:42	04/01/15 17:28	1
4-Bromophenyl phenyl ether	ND		1.9	0.21	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Nitroaniline	ND		1.9	0.20	ug/L		03/31/15 08:42	04/01/15 17:28	1
Pentachlorophenol	ND		4.8	0.26	ug/L		03/31/15 08:42	04/01/15 17:28	1
Dibenzofuran	ND		0.95	0.019	ug/L		03/31/15 08:42	04/01/15 17:28	1
Hexachlorocyclopentadiene	ND		9.5	0.23	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzo[a]anthracene	ND		0.19	0.028	ug/L		03/31/15 08:42	04/01/15 17:28	1
Chrysene	ND		0.19	0.048	ug/L		03/31/15 08:42	04/01/15 17:28	1
4,6-Dinitro-2-methylphenol	ND		4.8	2.3	ug/L		03/31/15 08:42	04/01/15 17:28	1
1,2,4,5-Tetrachlorobenzene	ND		0.95	0.52	ug/L		03/31/15 08:42	04/01/15 17:28	1
4-Chloroaniline	ND		1.9	0.20	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4-Dinitrotoluene	ND		4.8	0.24	ug/L		03/31/15 08:42	04/01/15 17:28	1
1-Methylnaphthalene	ND		0.19	0.033	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzo[k]fluoranthene	ND		0.19	0.043	ug/L		03/31/15 08:42	04/01/15 17:28	1
Azobenzene	ND		9.5	0.28	ug/L		03/31/15 08:42	04/01/15 17:28	1
Atrazine	ND		0.95	0.32	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzo[g,h,i]perylene	ND		0.19	0.044	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4-Dichlorophenol	ND		1.9	0.18	ug/L		03/31/15 08:42	04/01/15 17:28	1
Phenanthrene	ND		0.19	0.059	ug/L		03/31/15 08:42	04/01/15 17:28	1
Caprolactam	**0.38**	**J B**	4.8	0.19	ug/L		03/31/15 08:42	04/01/15 17:28	1
3-Nitroaniline	ND		1.9	0.27	ug/L		03/31/15 08:42	04/01/15 17:28	1
Fluoranthene	ND		0.19	0.042	ug/L		03/31/15 08:42	04/01/15 17:28	1
1,1'-Biphenyl	ND		0.95	0.12	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzo[b]fluoranthene	ND		0.19	0.038	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Methylphenol	ND		0.95	0.16	ug/L		03/31/15 08:42	04/01/15 17:28	1
N-Nitrosodi-n-propylamine	ND		0.95	0.23	ug/L		03/31/15 08:42	04/01/15 17:28	1
Pyrene	ND		0.19	0.040	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzoic acid	ND		24	9.5	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Methylnaphthalene	ND		0.19	0.086	ug/L		03/31/15 08:42	04/01/15 17:28	1
Hexachlorobenzene	ND		0.19	0.081	ug/L		03/31/15 08:42	04/01/15 17:28	1
Acenaphthene	ND		0.19	0.042	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,2'-oxybis[1-chloropropane]	ND		0.95	0.38	ug/L		03/31/15 08:42	04/01/15 17:28	1
Phenyl ether	ND		9.5	1.1	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,3,4,6-Tetrachlorophenol	ND		9.5	0.55	ug/L		03/31/15 08:42	04/01/15 17:28	1

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L94
Date Collected: 03/25/15 12:36
Date Received: 03/26/15 10:30

Lab Sample ID: 240-48655-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chloro-3-methylphenol	ND		1.9	0.20	ug/L		03/31/15 08:42	04/01/15 17:28	1
4-Chlorophenyl phenyl ether	ND		1.9	0.29	ug/L		03/31/15 08:42	04/01/15 17:28	1
Bis(2-ethylhexyl) phthalate	ND		4.8	1.6	ug/L		03/31/15 08:42	04/01/15 17:28	1
Butyl benzyl phthalate	ND		1.9	0.25	ug/L		03/31/15 08:42	04/01/15 17:28	1
Di-n-butyl phthalate	ND		4.8	1.6	ug/L		03/31/15 08:42	04/01/15 17:28	1
Isophorone	ND		0.95	0.26	ug/L		03/31/15 08:42	04/01/15 17:28	1
Phenol	ND		0.95	0.57	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,6-Dinitrotoluene	ND		4.8	0.76	ug/L		03/31/15 08:42	04/01/15 17:28	1
Diethyl phthalate	ND		1.9	0.57	ug/L		03/31/15 08:42	04/01/15 17:28	1
Indeno[1,2,3-cd]pyrene	ND		0.19	0.041	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4,6-Trichlorophenol	ND		4.8	0.23	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4,5-Trichlorophenol	ND		4.8	0.29	ug/L		03/31/15 08:42	04/01/15 17:28	1
Nitrobenzene	ND		0.95	0.038	ug/L		03/31/15 08:42	04/01/15 17:28	1
Anthracene	ND		0.19	0.084	ug/L		03/31/15 08:42	04/01/15 17:28	1
Bis(2-chloroethyl)ether	ND		0.95	0.095	ug/L		03/31/15 08:42	04/01/15 17:28	1
2-Chloronaphthalene	ND		0.95	0.095	ug/L		03/31/15 08:42	04/01/15 17:28	1
2,4-Dinitrophenol	ND		4.8	0.30	ug/L		03/31/15 08:42	04/01/15 17:28	1
4-Nitrophenol	ND		4.8	0.28	ug/L		03/31/15 08:42	04/01/15 17:28	1
Acetophenone	ND		0.95	0.32	ug/L		03/31/15 08:42	04/01/15 17:28	1
1,2-Dichlorobenzene	ND		0.95	0.28	ug/L		03/31/15 08:42	04/01/15 17:28	1
3,3'-Dichlorobenzidine	ND		4.8	0.35	ug/L		03/31/15 08:42	04/01/15 17:28	1
Hexachloroethane	ND		0.95	0.18	ug/L		03/31/15 08:42	04/01/15 17:28	1
Dimethyl phthalate	ND		1.9	0.28	ug/L		03/31/15 08:42	04/01/15 17:28	1
Benzophenone	ND		4.8	4.8	ug/L		03/31/15 08:42	04/01/15 17:28	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.1*	*T J*	*ug/L*		*4.78*		*03/31/15 08:42*	*04/01/15 17:28*	*1*
Unknown	*1.9*	*T J*	*ug/L*		*11.20*		*03/31/15 08:42*	*04/01/15 17:28*	*1*
Heptadecanoic acid	*0.76*	*T J N*	*ug/L*		*11.26*	*506-12-7*	*03/31/15 08:42*	*04/01/15 17:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*65*		*31 - 115*	*03/31/15 08:42*	*04/01/15 17:28*	*1*
2-Fluorobiphenyl (Surr)	*82*		*29 - 110*	*03/31/15 08:42*	*04/01/15 17:28*	*1*
2,4,6-Tribromophenol	*97*		*21 - 128*	*03/31/15 08:42*	*04/01/15 17:28*	*1*
Nitrobenzene-d5	*74*		*31 - 110*	*03/31/15 08:42*	*04/01/15 17:28*	*1*
Phenol-d5	*32*		*10 - 110*	*03/31/15 08:42*	*04/01/15 17:28*	*1*
2-Fluorophenol	*48*		*15 - 110*	*03/31/15 08:42*	*04/01/15 17:28*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aniline	ND	H	4.8	0.32	ug/L		04/03/15 07:48	04/06/15 15:22	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.4*	*T H J*	*ug/L*		*4.70*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown Hydrocarbon	*1.4*	*T H J*	*ug/L*		*7.35*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown Hydrocarbon	*4.3*	*T H J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown Hydrocarbon	*3.6*	*T H J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown PAH	*0.81*	*T H J*	*ug/L*		*8.61*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown	*1.6*	*T H J*	*ug/L*		*8.62*		*04/03/15 07:48*	*04/06/15 15:22*	*1*
Unknown Hydrocarbon	*1.5*	*T H J*	*ug/L*		*8.79*		*04/03/15 07:48*	*04/06/15 15:22*	*1*

Client Sample ID: OC-M24L94
Date Collected: 03/25/15 12:36
Date Received: 03/26/15 10:30

Lab Sample ID: 240-48655-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown Hydrocarbon	0.95	T H J	ug/L		9.21		04/03/15 07:48	04/06/15 15:22	1
n-Hexadecanoic acid	0.94	T H J N	ug/L		10.54	57-10-3	04/03/15 07:48	04/06/15 15:22	1
Unknown	1.3	T H J	ug/L		11.14		04/03/15 07:48	04/06/15 15:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	73		31 - 115	04/03/15 07:48	04/06/15 15:22	1
2-Fluorobiphenyl (Surr)	73		29 - 110	04/03/15 07:48	04/06/15 15:22	1
2,4,6-Tribromophenol	82		21 - 128	04/03/15 07:48	04/06/15 15:22	1
Nitrobenzene-d5	68		31 - 110	04/03/15 07:48	04/06/15 15:22	1
Phenol-d5	16		10 - 110	04/03/15 07:48	04/06/15 15:22	1
2-Fluorophenol	29		15 - 110	04/03/15 07:48	04/06/15 15:22	1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.45	ng/L		03/31/15 11:25	04/03/15 23:49	1
N-Nitrosodimethylamine	**1.0**	**J**	1.9	0.37	ng/L		03/31/15 11:25	04/03/15 23:49	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
N-Nitrosodimethylamine-d6	38		25 - 150	03/31/15 11:25	04/03/15 23:49	1
N-Nitrosodi-n-propylamine-d14	89		25 - 150	03/31/15 11:25	04/03/15 23:49	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		2.0	0.80	mg/L			03/30/15 16:35	4
Sulfate	**18**		1.0	0.40	mg/L			03/28/15 10:59	1

Method: 6010 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		03/30/15 11:41	03/31/15 08:44	1
Sodium	**59000**		5000	180	ug/L		03/30/15 11:41	03/31/15 08:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND	F1	0.25	0.10	mg/L		04/01/15 11:40	04/01/15 15:29	1
Nitrate as N	**2.2**		0.10	0.020	mg/L			03/26/15 17:15	2
Nitrite as N	ND		0.10	0.020	mg/L			03/26/15 17:15	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/26/15 11:16	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TPH	FBP	TBP	NBZ	PHL	2FP
Lab Sample ID	Client Sample ID	(31-115)	(29-110)	(21-128)	(31-110)	(10-110)	(15-110)
240-48587-5	OC-M15L2C	67	80	68	74	21	34
240-48587-5 - RE	OC-M15L2C	74	79	87	70	19	34
240-48587-6	OC-M02L07	65	81	71	75	19	32
240-48587-11	OC-M24L64	68	74	74	74	20	35
240-48587-11 - RE	OC-M24L64	67	61	63	56	14	23
240-48587-13	OC-M24L63	63	71	70	66	18	29
240-48587-13 - RE	OC-M24L63	74	76	86	66	20	33
240-48587-15	OC-M24L54	65	76	71	74	21	36
240-48587-15 - RE	OC-M24L54	73	73	71	68	22	31
240-48655-2	OC-M24L94	65	82	97	74	32	48
240-48655-2 - RE	OC-M24L94	73	73	82	68	16	29
LCS 240-173777/15-A	Lab Control Sample	73	75	89	77	37	50
LCS 240-174423/15-A	Lab Control Sample	72	77	97	79	49	62
LCS 240-174965/8-A	Lab Control Sample	87	84	101	78	43	51
LCSD 240-173777/16-A	Lab Control Sample Dup	72	78	85	82	40	57
LCSD 240-174423/16-A	Lab Control Sample Dup	79	81	101	81	45	60
LCSD 240-174965/9-A	Lab Control Sample Dup	81	83	99	76	42	50
MB 240-173777/14-A	Method Blank	79	76	67	73	36	54
MB 240-174423/14-A	Method Blank	86	77	84	76	52	68
MB 240-174965/7-A	Method Blank	86	79	80	74	48	62

Surrogate Legend

TPH = Terphenyl-d14 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
2FP = 2-Fluorophenol

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-173777/14-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173777

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Nitrophenol	ND		2.0	0.28	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzaldehyde	ND		1.0	0.39	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		03/26/15 08:57	03/31/15 15:25	1
Fluorene	ND		0.20	0.041	ug/L		03/26/15 08:57	03/31/15 15:25	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		03/26/15 08:57	03/31/15 15:25	1
Carbazole	ND		1.0	0.28	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzyl alcohol	ND		5.0	0.38	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		03/26/15 08:57	03/31/15 15:25	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Nitroaniline	ND		2.0	0.22	ug/L		03/26/15 08:57	03/31/15 15:25	1
Aniline	ND		5.0	0.34	ug/L		03/26/15 08:57	03/31/15 15:25	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		03/26/15 08:57	03/31/15 15:25	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		03/26/15 08:57	03/31/15 15:25	1
Acenaphthylene	ND		0.20	0.048	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Chlorophenol	ND		1.0	0.29	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Nitroaniline	ND		2.0	0.21	ug/L		03/26/15 08:57	03/31/15 15:25	1
Pentachlorophenol	ND		5.0	0.27	ug/L		03/26/15 08:57	03/31/15 15:25	1
Dibenzofuran	ND		1.0	0.020	ug/L		03/26/15 08:57	03/31/15 15:25	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzo[a]anthracene	ND		0.20	0.030	ug/L		03/26/15 08:57	03/31/15 15:25	1
Chrysene	ND		0.20	0.050	ug/L		03/26/15 08:57	03/31/15 15:25	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		03/26/15 08:57	03/31/15 15:25	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Chloroaniline	ND		2.0	0.21	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		03/26/15 08:57	03/31/15 15:25	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		03/26/15 08:57	03/31/15 15:25	1
Azobenzene	ND		10	0.29	ug/L		03/26/15 08:57	03/31/15 15:25	1
Atrazine	ND		1.0	0.34	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		03/26/15 08:57	03/31/15 15:25	1
Phenanthrene	ND		0.20	0.062	ug/L		03/26/15 08:57	03/31/15 15:25	1
Caprolactam	0.489	J	5.0	0.20	ug/L		03/26/15 08:57	03/31/15 15:25	1
3-Nitroaniline	ND		2.0	0.28	ug/L		03/26/15 08:57	03/31/15 15:25	1
Fluoranthene	ND		0.20	0.045	ug/L		03/26/15 08:57	03/31/15 15:25	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Methylphenol	ND		1.0	0.17	ug/L		03/26/15 08:57	03/31/15 15:25	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		03/26/15 08:57	03/31/15 15:25	1
Pyrene	ND		0.20	0.042	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzoic acid	ND		25	10	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		03/26/15 08:57	03/31/15 15:25	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		03/26/15 08:57	03/31/15 15:25	1
Acenaphthene	ND		0.20	0.044	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		03/26/15 08:57	03/31/15 15:25	1
Phenyl ether	ND		10	1.2	ug/L		03/26/15 08:57	03/31/15 15:25	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-173777/14-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 173777

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		03/26/15 08:57	03/31/15 15:25	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		03/26/15 08:57	03/31/15 15:25	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		03/26/15 08:57	03/31/15 15:25	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		03/26/15 08:57	03/31/15 15:25	1
Isophorone	ND		1.0	0.27	ug/L		03/26/15 08:57	03/31/15 15:25	1
Phenol	ND		1.0	0.60	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		03/26/15 08:57	03/31/15 15:25	1
Diethyl phthalate	ND		2.0	0.60	ug/L		03/26/15 08:57	03/31/15 15:25	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		03/26/15 08:57	03/31/15 15:25	1
Nitrobenzene	ND		1.0	0.040	ug/L		03/26/15 08:57	03/31/15 15:25	1
Anthracene	ND		0.20	0.088	ug/L		03/26/15 08:57	03/31/15 15:25	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		03/26/15 08:57	03/31/15 15:25	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		03/26/15 08:57	03/31/15 15:25	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		03/26/15 08:57	03/31/15 15:25	1
4-Nitrophenol	ND		5.0	0.29	ug/L		03/26/15 08:57	03/31/15 15:25	1
Acetophenone	ND		1.0	0.34	ug/L		03/26/15 08:57	03/31/15 15:25	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		03/26/15 08:57	03/31/15 15:25	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		03/26/15 08:57	03/31/15 15:25	1
Hexachloroethane	ND		1.0	0.19	ug/L		03/26/15 08:57	03/31/15 15:25	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		03/26/15 08:57	03/31/15 15:25	1
Benzophenone	ND		5.0	5.0	ug/L		03/26/15 08:57	03/31/15 15:25	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.01*	*T J*	*ug/L*		*5.37*		*03/26/15 08:57*	*03/31/15 15:25*	*1*
Unknown	*1.02*	*T J*	*ug/L*		*10.30*		*03/26/15 08:57*	*03/31/15 15:25*	*1*
Unknown	*1.28*	*T J*	*ug/L*		*10.44*		*03/26/15 08:57*	*03/31/15 15:25*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*79*		*31 - 115*	*03/26/15 08:57*	*03/31/15 15:25*	*1*
2-Fluorobiphenyl (Surr)	*76*		*29 - 110*	*03/26/15 08:57*	*03/31/15 15:25*	*1*
2,4,6-Tribromophenol	*67*		*21 - 128*	*03/26/15 08:57*	*03/31/15 15:25*	*1*
Nitrobenzene-d5	*73*		*31 - 110*	*03/26/15 08:57*	*03/31/15 15:25*	*1*
Phenol-d5	*36*		*10 - 110*	*03/26/15 08:57*	*03/31/15 15:25*	*1*
2-Fluorophenol	*54*		*15 - 110*	*03/26/15 08:57*	*03/31/15 15:25*	*1*

Lab Sample ID: LCS 240-173777/15-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	17.2		ug/L		86	24 - 125
2-Nitrophenol	20.0	15.2		ug/L		76	42 - 120
Benzaldehyde	40.0	36.8		ug/L		92	40 - 122

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-173777/15-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-Dimethylphenol	20.0	13.7		ug/L		68	38 - 120
Fluorene	20.0	14.8		ug/L		74	56 - 120
Di-n-octyl phthalate	20.0	14.3		ug/L		72	21 - 122
Carbazole	20.0	17.2		ug/L		86	57 - 120
Benzyl alcohol	20.0	12.7		ug/L		63	23 - 110
Benzo[a]pyrene	20.0	15.4		ug/L		77	24 - 120
3 & 4 Methylphenol	20.0	12.4		ug/L		62	34 - 120
4-Nitroaniline	20.0	15.0		ug/L		75	48 - 120
Aniline	20.0	13.8		ug/L		69	10 - 123
Bis(2-chloroethoxy)methane	20.0	15.6		ug/L		78	48 - 120
N-Nitrosodiphenylamine	40.0	32.6		ug/L		81	51 - 120
Acenaphthylene	20.0	14.3		ug/L		71	55 - 120
2-Chlorophenol	20.0	14.5		ug/L		73	43 - 120
4-Bromophenyl phenyl ether	20.0	16.6		ug/L		83	47 - 120
2-Nitroaniline	20.0	19.0		ug/L		95	48 - 127
Pentachlorophenol	40.0	27.1		ug/L		68	14 - 120
Dibenzofuran	20.0	15.2		ug/L		76	56 - 120
Hexachlorocyclopentadiene	20.0	9.05	J	ug/L		45	4 - 120
Benzo[a]anthracene	20.0	15.6		ug/L		78	46 - 120
Chrysene	20.0	16.7		ug/L		84	49 - 120
4,6-Dinitro-2-methylphenol	40.0	27.4		ug/L		69	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	14.8		ug/L		74	40 - 160
4-Chloroaniline	20.0	13.9		ug/L		69	15 - 120
2,4-Dinitrotoluene	20.0	16.7		ug/L		84	52 - 120
1-Methylnaphthalene	20.0	15.1		ug/L		76	54 - 110
Benzo[k]fluoranthene	20.0	16.2		ug/L		81	30 - 120
Azobenzene	20.0	26.1		ug/L		131	50 - 150
Atrazine	40.0	35.2		ug/L		88	65 - 161
Benzo[g,h,i]perylene	20.0	18.9		ug/L		94	24 - 126
2,4-Dichlorophenol	20.0	15.4		ug/L		77	46 - 120
Phenanthrene	20.0	15.7		ug/L		79	57 - 120
Caprolactam	40.0	11.0		ug/L		27	10 - 120
3-Nitroaniline	20.0	16.1		ug/L		81	52 - 120
Fluoranthene	20.0	17.6		ug/L		88	57 - 120
1,1'-Biphenyl	20.0	14.6		ug/L		73	52 - 120
Benzo[b]fluoranthene	20.0	15.7		ug/L		78	24 - 120
2-Methylphenol	20.0	13.0		ug/L		65	38 - 120
N-Nitrosodi-n-propylamine	20.0	15.4		ug/L		77	48 - 123
Pyrene	20.0	16.4		ug/L		82	50 - 120
Benzoic acid	40.0	ND	*	ug/L		9	10 - 110
2-Methylnaphthalene	20.0	13.9		ug/L		69	52 - 120
Hexachlorobenzene	20.0	16.7		ug/L		83	52 - 120
Acenaphthene	20.0	15.0		ug/L		75	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	15.3		ug/L		76	42 - 120
Phenyl ether	20.0	16.0		ug/L		80	40 - 160
2,3,4,6-Tetrachlorophenol	20.0	16.4		ug/L		82	50 - 150
4-Chloro-3-methylphenol	20.0	15.1		ug/L		76	45 - 120
4-Chlorophenyl phenyl ether	20.0	15.6		ug/L		78	47 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-173777/15-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 173777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.7		ug/L		74	21 - 125
Butyl benzyl phthalate	20.0	15.4		ug/L		77	51 - 120
Di-n-butyl phthalate	20.0	18.2		ug/L		91	57 - 122
Isophorone	20.0	15.3		ug/L		76	48 - 123
Phenol	20.0	7.31		ug/L		37	16 - 120
2,6-Dinitrotoluene	20.0	16.7		ug/L		83	52 - 120
Diethyl phthalate	20.0	15.5		ug/L		78	58 - 120
Indeno[1,2,3-cd]pyrene	20.0	17.8		ug/L		89	25 - 120
2,4,6-Trichlorophenol	20.0	16.1		ug/L		80	43 - 120
2,4,5-Trichlorophenol	20.0	16.0		ug/L		80	47 - 120
Nitrobenzene	20.0	15.7		ug/L		79	41 - 120
Anthracene	20.0	15.6		ug/L		78	56 - 120
Bis(2-chloroethyl)ether	20.0	15.3		ug/L		76	43 - 120
2-Chloronaphthalene	20.0	14.9		ug/L		75	47 - 120
2,4-Dinitrophenol	40.0	21.0		ug/L		53	10 - 120
4-Nitrophenol	40.0	17.1		ug/L		43	16 - 120
Acetophenone	20.0	15.8		ug/L		79	50 - 120
1,2-Dichlorobenzene	20.0	13.3		ug/L		66	52 - 110
3,3'-Dichlorobenzidine	40.0	34.1		ug/L		85	29 - 120
Hexachloroethane	20.0	12.8		ug/L		64	42 - 120
Dimethyl phthalate	20.0	16.0		ug/L		80	59 - 120
Benzophenone	20.0	22.4		ug/L		112	10 - 160

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*73*		*31 - 115*
2-Fluorobiphenyl (Surr)	*75*		*29 - 110*
2,4,6-Tribromophenol	*89*		*21 - 128*
Nitrobenzene-d5	*77*		*31 - 110*
Phenol-d5	*37*		*10 - 110*
2-Fluorophenol	*50*		*15 - 110*

Lab Sample ID: LCSD 240-173777/16-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173777

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene	20.0	17.7		ug/L		89	24 - 125	3	30
2-Nitrophenol	20.0	16.6		ug/L		83	42 - 120	9	30
Benzaldehyde	40.0	38.1		ug/L		95	40 - 122	3	30
2,4-Dimethylphenol	20.0	15.4		ug/L		77	38 - 120	12	30
Fluorene	20.0	15.5		ug/L		77	56 - 120	4	30
Di-n-octyl phthalate	20.0	15.0		ug/L		75	21 - 122	5	30
Carbazole	20.0	18.3		ug/L		92	57 - 120	6	30
Benzyl alcohol	20.0	13.6		ug/L		68	23 - 110	7	30
Benzo[a]pyrene	20.0	16.1		ug/L		81	24 - 120	4	30
3 & 4 Methylphenol	20.0	13.9		ug/L		70	34 - 120	12	30
4-Nitroaniline	20.0	16.4		ug/L		82	48 - 120	9	30
Aniline	20.0	14.5		ug/L		73	10 - 123	5	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-173777/16-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173777

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-chloroethoxy)methane	20.0	17.1		ug/L		85	48 - 120	9	30
N-Nitrosodiphenylamine	40.0	33.9		ug/L		85	51 - 120	4	30
Acenaphthylene	20.0	15.1		ug/L		75	55 - 120	5	30
2-Chlorophenol	20.0	15.7		ug/L		79	43 - 120	8	30
4-Bromophenyl phenyl ether	20.0	17.7		ug/L		88	47 - 120	6	30
2-Nitroaniline	20.0	20.3		ug/L		102	48 - 127	6	30
Pentachlorophenol	40.0	27.6		ug/L		69	14 - 120	2	30
Dibenzofuran	20.0	15.9		ug/L		80	56 - 120	5	30
Hexachlorocyclopentadiene	20.0	8.90	J	ug/L		44	4 - 120	2	30
Benzo[a]anthracene	20.0	16.0		ug/L		80	46 - 120	2	30
Chrysene	20.0	17.2		ug/L		86	49 - 120	3	30
4,6-Dinitro-2-methylphenol	40.0	29.2		ug/L		73	33 - 120	6	30
1,2,4,5-Tetrachlorobenzene	20.0	15.2		ug/L		76	40 - 160	3	30
4-Chloroaniline	20.0	15.3		ug/L		77	15 - 120	10	30
2,4-Dinitrotoluene	20.0	16.9		ug/L		84	52 - 120	1	30
1-Methylnaphthalene	20.0	16.0		ug/L		80	54 - 110	5	30
Benzo[k]fluoranthene	20.0	17.7		ug/L		89	30 - 120	9	30
Azobenzene	20.0	27.3		ug/L		137	50 - 150	5	30
Atrazine	40.0	36.8		ug/L		92	65 - 161	4	30
Benzo[g,h,i]perylene	20.0	19.8		ug/L		99	24 - 126	5	30
2,4-Dichlorophenol	20.0	16.8		ug/L		84	46 - 120	9	30
Phenanthrene	20.0	16.5		ug/L		83	57 - 120	5	30
Caprolactam	40.0	12.7		ug/L		32	10 - 120	15	30
3-Nitroaniline	20.0	16.8		ug/L		84	52 - 120	4	30
Fluoranthene	20.0	17.9		ug/L		90	57 - 120	2	30
1,1'-Biphenyl	20.0	15.2		ug/L		76	52 - 120	4	30
Benzo[b]fluoranthene	20.0	15.9		ug/L		80	24 - 120	2	30
2-Methylphenol	20.0	14.2		ug/L		71	38 - 120	9	30
N-Nitrosodi-n-propylamine	20.0	16.5		ug/L		83	48 - 123	7	30
Pyrene	20.0	17.0		ug/L		85	50 - 120	3	30
Benzoic acid	40.0	ND	*	ug/L		9	10 - 110	3	30
2-Methylnaphthalene	20.0	14.5		ug/L		72	52 - 120	4	30
Hexachlorobenzene	20.0	16.9		ug/L		85	52 - 120	1	30
Acenaphthene	20.0	15.8		ug/L		79	55 - 120	6	30
2,2'-oxybis[1-chloropropane]	20.0	16.0		ug/L		80	42 - 120	5	30
Phenyl ether	20.0	16.6		ug/L		83	40 - 160	4	30
2,3,4,6-Tetrachlorophenol	20.0	17.2		ug/L		86	50 - 150	5	30
4-Chloro-3-methylphenol	20.0	16.7		ug/L		83	45 - 120	10	30
4-Chlorophenyl phenyl ether	20.0	16.1		ug/L		80	47 - 120	3	30
Bis(2-ethylhexyl) phthalate	20.0	15.1		ug/L		76	21 - 125	2	30
Butyl benzyl phthalate	20.0	16.1		ug/L		80	51 - 120	4	30
Di-n-butyl phthalate	20.0	18.5		ug/L		93	57 - 122	2	30
Isophorone	20.0	16.6		ug/L		83	48 - 123	9	30
Phenol	20.0	8.42		ug/L		42	16 - 120	14	30
2,6-Dinitrotoluene	20.0	17.2		ug/L		86	52 - 120	3	30
Diethyl phthalate	20.0	16.1		ug/L		81	58 - 120	4	30
Indeno[1,2,3-cd]pyrene	20.0	18.6		ug/L		93	25 - 120	5	30
2,4,6-Trichlorophenol	20.0	16.9		ug/L		85	43 - 120	5	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-173777/16-A
Matrix: Water
Analysis Batch: 174402

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 173777

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-Trichlorophenol			20.0	17.2		ug/L		86	47 - 120	7	30
Nitrobenzene			20.0	17.1		ug/L		86	41 - 120	8	30
Anthracene			20.0	16.3		ug/L		82	56 - 120	5	30
Bis(2-chloroethyl)ether			20.0	16.5		ug/L		83	43 - 120	8	30
2-Chloronaphthalene			20.0	15.4		ug/L		77	47 - 120	3	30
2,4-Dinitrophenol			40.0	23.3		ug/L		58	10 - 120	10	30
4-Nitrophenol			40.0	19.1		ug/L		48	16 - 120	11	30
Acetophenone			20.0	16.7		ug/L		83	50 - 120	5	30
1,2-Dichlorobenzene			20.0	13.3		ug/L		66	52 - 110	0	30
3,3'-Dichlorobenzidine			40.0	35.5		ug/L		89	29 - 120	4	30
Hexachloroethane			20.0	12.3		ug/L		62	42 - 120	4	30
Dimethyl phthalate			20.0	16.9		ug/L		84	59 - 120	5	30
Benzophenone			20.0	23.3		ug/L		117	10 - 160	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*72*		*31 - 115*
2-Fluorobiphenyl (Surr)	*78*		*29 - 110*
2,4,6-Tribromophenol	*85*		*21 - 128*
Nitrobenzene-d5	*82*		*31 - 110*
Phenol-d5	*40*		*10 - 110*
2-Fluorophenol	*57*		*15 - 110*

Lab Sample ID: MB 240-174423/14-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174423

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Nitrophenol	ND		2.0	0.28	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzaldehyde	ND		1.0	0.39	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		03/31/15 08:42	04/01/15 09:33	1
Fluorene	ND		0.20	0.041	ug/L		03/31/15 08:42	04/01/15 09:33	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		03/31/15 08:42	04/01/15 09:33	1
Carbazole	ND		1.0	0.28	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzyl alcohol	ND		5.0	0.38	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		03/31/15 08:42	04/01/15 09:33	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Nitroaniline	ND		2.0	0.22	ug/L		03/31/15 08:42	04/01/15 09:33	1
Aniline	ND		5.0	0.34	ug/L		03/31/15 08:42	04/01/15 09:33	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		03/31/15 08:42	04/01/15 09:33	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		03/31/15 08:42	04/01/15 09:33	1
Acenaphthylene	ND		0.20	0.048	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Chlorophenol	ND		1.0	0.29	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Nitroaniline	ND		2.0	0.21	ug/L		03/31/15 08:42	04/01/15 09:33	1
Pentachlorophenol	ND		5.0	0.27	ug/L		03/31/15 08:42	04/01/15 09:33	1
Dibenzofuran	ND		1.0	0.020	ug/L		03/31/15 08:42	04/01/15 09:33	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		03/31/15 08:42	04/01/15 09:33	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-174423/14-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174423

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	ND		0.20	0.030	ug/L		03/31/15 08:42	04/01/15 09:33	1
Chrysene	ND		0.20	0.050	ug/L		03/31/15 08:42	04/01/15 09:33	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		03/31/15 08:42	04/01/15 09:33	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Chloroaniline	ND		2.0	0.21	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		03/31/15 08:42	04/01/15 09:33	1
1-Methylnaphthalene	ND		0.20	0.034	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		03/31/15 08:42	04/01/15 09:33	1
Azobenzene	ND		10	0.29	ug/L		03/31/15 08:42	04/01/15 09:33	1
Atrazine	ND		1.0	0.34	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		03/31/15 08:42	04/01/15 09:33	1
Phenanthrene	ND		0.20	0.062	ug/L		03/31/15 08:42	04/01/15 09:33	1
Caprolactam	0.603	J	5.0	0.20	ug/L		03/31/15 08:42	04/01/15 09:33	1
3-Nitroaniline	ND		2.0	0.28	ug/L		03/31/15 08:42	04/01/15 09:33	1
Fluoranthene	ND		0.20	0.045	ug/L		03/31/15 08:42	04/01/15 09:33	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Methylphenol	ND		1.0	0.17	ug/L		03/31/15 08:42	04/01/15 09:33	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		03/31/15 08:42	04/01/15 09:33	1
Pyrene	ND		0.20	0.042	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzoic acid	ND		25	10	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Methylnaphthalene	ND		0.20	0.090	ug/L		03/31/15 08:42	04/01/15 09:33	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		03/31/15 08:42	04/01/15 09:33	1
Acenaphthene	ND		0.20	0.044	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		03/31/15 08:42	04/01/15 09:33	1
Phenyl ether	ND		10	1.2	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		03/31/15 08:42	04/01/15 09:33	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		03/31/15 08:42	04/01/15 09:33	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		03/31/15 08:42	04/01/15 09:33	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		03/31/15 08:42	04/01/15 09:33	1
Isophorone	ND		1.0	0.27	ug/L		03/31/15 08:42	04/01/15 09:33	1
Phenol	ND		1.0	0.60	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		03/31/15 08:42	04/01/15 09:33	1
Diethyl phthalate	ND		2.0	0.60	ug/L		03/31/15 08:42	04/01/15 09:33	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		03/31/15 08:42	04/01/15 09:33	1
Nitrobenzene	ND		1.0	0.040	ug/L		03/31/15 08:42	04/01/15 09:33	1
Anthracene	ND		0.20	0.088	ug/L		03/31/15 08:42	04/01/15 09:33	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		03/31/15 08:42	04/01/15 09:33	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		03/31/15 08:42	04/01/15 09:33	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		03/31/15 08:42	04/01/15 09:33	1
4-Nitrophenol	ND		5.0	0.29	ug/L		03/31/15 08:42	04/01/15 09:33	1
Acetophenone	ND		1.0	0.34	ug/L		03/31/15 08:42	04/01/15 09:33	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		03/31/15 08:42	04/01/15 09:33	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-174423/14-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174423

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		03/31/15 08:42	04/01/15 09:33	1
Hexachloroethane	ND		1.0	0.19	ug/L		03/31/15 08:42	04/01/15 09:33	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		03/31/15 08:42	04/01/15 09:33	1
Benzophenone	ND		5.0	5.0	ug/L		03/31/15 08:42	04/01/15 09:33	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*1.50*	*T J*	*ug/L*		*10.41*		*03/31/15 08:42*	*04/01/15 09:33*	*1*
Unknown	*1.74*	*T J*	*ug/L*		*11.20*		*03/31/15 08:42*	*04/01/15 09:33*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*86*		*31 - 115*	*03/31/15 08:42*	*04/01/15 09:33*	*1*
2-Fluorobiphenyl (Surr)	*77*		*29 - 110*	*03/31/15 08:42*	*04/01/15 09:33*	*1*
2,4,6-Tribromophenol	*84*		*21 - 128*	*03/31/15 08:42*	*04/01/15 09:33*	*1*
Nitrobenzene-d5	*76*		*31 - 110*	*03/31/15 08:42*	*04/01/15 09:33*	*1*
Phenol-d5	*52*		*10 - 110*	*03/31/15 08:42*	*04/01/15 09:33*	*1*
2-Fluorophenol	*68*		*15 - 110*	*03/31/15 08:42*	*04/01/15 09:33*	*1*

Lab Sample ID: LCS 240-174423/15-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174423

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	18.9		ug/L		94	24 - 125
2-Nitrophenol	20.0	16.2		ug/L		81	42 - 120
Benzaldehyde	40.0	38.9		ug/L		97	40 - 122
2,4-Dimethylphenol	20.0	15.5		ug/L		78	38 - 120
Fluorene	20.0	15.7		ug/L		78	56 - 120
Di-n-octyl phthalate	20.0	14.9		ug/L		75	21 - 122
Carbazole	20.0	17.2		ug/L		86	57 - 120
Benzyl alcohol	20.0	12.7		ug/L		64	23 - 110
Benzo[a]pyrene	20.0	16.2		ug/L		81	24 - 120
3 & 4 Methylphenol	20.0	14.6		ug/L		73	34 - 120
4-Nitroaniline	20.0	17.4		ug/L		87	48 - 120
Aniline	20.0	1.69	J *	ug/L		8	10 - 123
Bis(2-chloroethoxy)methane	20.0	16.3		ug/L		81	48 - 120
N-Nitrosodiphenylamine	40.0	31.4		ug/L		78	51 - 120
Acenaphthylene	20.0	14.7		ug/L		74	55 - 120
2-Chlorophenol	20.0	16.0		ug/L		80	43 - 120
4-Bromophenyl phenyl ether	20.0	17.0		ug/L		85	47 - 120
2-Nitroaniline	20.0	20.6		ug/L		103	48 - 127
Pentachlorophenol	40.0	31.2		ug/L		78	14 - 120
Dibenzofuran	20.0	15.9		ug/L		79	56 - 120
Hexachlorocyclopentadiene	20.0	9.81	J	ug/L		49	4 - 120
Benzo[a]anthracene	20.0	16.5		ug/L		82	46 - 120
Chrysene	20.0	17.5		ug/L		88	49 - 120
4,6-Dinitro-2-methylphenol	40.0	32.1		ug/L		80	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	14.4		ug/L		72	40 - 160

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-174423/15-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174423

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chloroaniline	20.0	12.1		ug/L		61	15 - 120
2,4-Dinitrotoluene	20.0	17.8		ug/L		89	52 - 120
1-Methylnaphthalene	20.0	15.9		ug/L		79	54 - 110
Benzo[k]fluoranthene	20.0	16.4		ug/L		82	30 - 120
Azobenzene	20.0	26.0		ug/L		130	50 - 150
Atrazine	40.0	34.1		ug/L		85	65 - 161
Benzo[g,h,i]perylene	20.0	20.2		ug/L		101	24 - 126
2,4-Dichlorophenol	20.0	16.1		ug/L		80	46 - 120
Phenanthrene	20.0	16.0		ug/L		80	57 - 120
Caprolactam	40.0	8.83		ug/L		22	10 - 120
3-Nitroaniline	20.0	17.5		ug/L		88	52 - 120
Fluoranthene	20.0	17.5		ug/L		87	57 - 120
1,1'-Biphenyl	20.0	14.8		ug/L		74	52 - 120
Benzo[b]fluoranthene	20.0	16.9		ug/L		85	24 - 120
2-Methylphenol	20.0	15.0		ug/L		75	38 - 120
N-Nitrosodi-n-propylamine	20.0	17.2		ug/L		86	48 - 123
Pyrene	20.0	17.9		ug/L		90	50 - 120
Benzoic acid	40.0	ND		ug/L		22	10 - 110
2-Methylnaphthalene	20.0	14.3		ug/L		72	52 - 120
Hexachlorobenzene	20.0	16.7		ug/L		83	52 - 120
Acenaphthene	20.0	15.6		ug/L		78	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	16.3		ug/L		81	42 - 120
Phenyl ether	20.0	16.7		ug/L		84	40 - 160
2,3,4,6-Tetrachlorophenol	20.0	18.0		ug/L		90	50 - 150
4-Chloro-3-methylphenol	20.0	16.6		ug/L		83	45 - 120
4-Chlorophenyl phenyl ether	20.0	16.2		ug/L		81	47 - 120
Bis(2-ethylhexyl) phthalate	20.0	15.8		ug/L		79	21 - 125
Butyl benzyl phthalate	20.0	16.6		ug/L		83	51 - 120
Di-n-butyl phthalate	20.0	18.1		ug/L		91	57 - 122
Isophorone	20.0	16.2		ug/L		81	48 - 123
Phenol	20.0	9.88		ug/L		49	16 - 120
2,6-Dinitrotoluene	20.0	17.6		ug/L		88	52 - 120
Diethyl phthalate	20.0	16.8		ug/L		84	58 - 120
Indeno[1,2,3-cd]pyrene	20.0	19.1		ug/L		95	25 - 120
2,4,6-Trichlorophenol	20.0	16.8		ug/L		84	43 - 120
2,4,5-Trichlorophenol	20.0	16.9		ug/L		85	47 - 120
Nitrobenzene	20.0	16.3		ug/L		81	41 - 120
Anthracene	20.0	16.0		ug/L		80	56 - 120
Bis(2-chloroethyl)ether	20.0	15.7		ug/L		78	43 - 120
2-Chloronaphthalene	20.0	15.1		ug/L		75	47 - 120
2,4-Dinitrophenol	40.0	31.8		ug/L		79	10 - 120
4-Nitrophenol	40.0	24.6		ug/L		62	16 - 120
Acetophenone	20.0	17.1		ug/L		85	50 - 120
1,2-Dichlorobenzene	20.0	13.3		ug/L		67	52 - 110
3,3'-Dichlorobenzidine	40.0	34.8		ug/L		87	29 - 120
Hexachloroethane	20.0	12.0		ug/L		60	42 - 120
Dimethyl phthalate	20.0	17.0		ug/L		85	59 - 120
Benzophenone	20.0	24.8		ug/L		124	10 - 160

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-174423/15-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174423

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*72*		*31 - 115*
2-Fluorobiphenyl (Surr)	*77*		*29 - 110*
2,4,6-Tribromophenol	*97*		*21 - 128*
Nitrobenzene-d5	*79*		*31 - 110*
Phenol-d5	*49*		*10 - 110*
2-Fluorophenol	*62*		*15 - 110*

Lab Sample ID: LCSD 240-174423/16-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174423

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene			20.0	20.2		ug/L		101	24 - 125	7	30
2-Nitrophenol			20.0	17.6		ug/L		88	42 - 120	8	30
Benzaldehyde			40.0	38.9		ug/L		97	40 - 122	0	30
2,4-Dimethylphenol			20.0	15.9		ug/L		79	38 - 120	2	30
Fluorene			20.0	16.8		ug/L		84	56 - 120	7	30
Di-n-octyl phthalate			20.0	16.1		ug/L		80	21 - 122	7	30
Carbazole			20.0	18.6		ug/L		93	57 - 120	8	30
Benzyl alcohol			20.0	12.4		ug/L		62	23 - 110	3	30
Benzo[a]pyrene			20.0	17.6		ug/L		88	24 - 120	9	30
3 & 4 Methylphenol			20.0	14.8		ug/L		74	34 - 120	1	30
4-Nitroaniline			20.0	18.4		ug/L		92	48 - 120	6	30
Aniline			20.0	1.38	J *	ug/L		7	10 - 123	21	30
Bis(2-chloroethoxy)methane			20.0	17.1		ug/L		86	48 - 120	5	30
N-Nitrosodiphenylamine			40.0	34.2		ug/L		86	51 - 120	9	30
Acenaphthylene			20.0	16.3		ug/L		81	55 - 120	10	30
2-Chlorophenol			20.0	15.8		ug/L		79	43 - 120	1	30
4-Bromophenyl phenyl ether			20.0	18.0		ug/L		90	47 - 120	6	30
2-Nitroaniline			20.0	21.9		ug/L		110	48 - 127	6	30
Pentachlorophenol			40.0	35.9		ug/L		90	14 - 120	14	30
Dibenzofuran			20.0	17.4		ug/L		87	56 - 120	9	30
Hexachlorocyclopentadiene			20.0	10.6		ug/L		53	4 - 120	8	30
Benzo[a]anthracene			20.0	17.3		ug/L		86	46 - 120	5	30
Chrysene			20.0	18.5		ug/L		93	49 - 120	5	30
4,6-Dinitro-2-methylphenol			40.0	35.6		ug/L		89	33 - 120	10	30
1,2,4,5-Tetrachlorobenzene			20.0	15.2		ug/L		76	40 - 160	5	30
4-Chloroaniline			20.0	11.8		ug/L		59	15 - 120	2	30
2,4-Dinitrotoluene			20.0	19.1		ug/L		95	52 - 120	7	30
1-Methylnaphthalene			20.0	16.5		ug/L		83	54 - 110	4	30
Benzo[k]fluoranthene			20.0	18.9		ug/L		94	30 - 120	14	30
Azobenzene			20.0	27.7		ug/L		139	50 - 150	6	30
Atrazine			40.0	37.4		ug/L		93	65 - 161	9	30
Benzo[g,h,i]perylene			20.0	21.4		ug/L		107	24 - 126	6	30
2,4-Dichlorophenol			20.0	16.6		ug/L		83	46 - 120	3	30
Phenanthrene			20.0	17.4		ug/L		87	57 - 120	8	30
Caprolactam			40.0	9.10		ug/L		23	10 - 120	3	30
3-Nitroaniline			20.0	18.9		ug/L		94	52 - 120	8	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-174423/16-A
Matrix: Water
Analysis Batch: 174592

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174423

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoranthene			20.0	19.1		ug/L		95	57 - 120	9	30
1,1'-Biphenyl			20.0	16.1		ug/L		80	52 - 120	8	30
Benzo[b]fluoranthene			20.0	17.2		ug/L		86	24 - 120	2	30
2-Methylphenol			20.0	14.7		ug/L		74	38 - 120	2	30
N-Nitrosodi-n-propylamine			20.0	16.8		ug/L		84	48 - 123	2	30
Pyrene			20.0	18.8		ug/L		94	50 - 120	5	30
Benzoic acid			40.0	ND		ug/L		17	10 - 110	29	30
2-Methylnaphthalene			20.0	15.0		ug/L		75	52 - 120	4	30
Hexachlorobenzene			20.0	18.6		ug/L		93	52 - 120	11	30
Acenaphthene			20.0	16.8		ug/L		84	55 - 120	7	30
2,2'-oxybis[1-chloropropane]			20.0	16.4		ug/L		82	42 - 120	1	30
Phenyl ether			20.0	18.2		ug/L		91	40 - 160	8	30
2,3,4,6-Tetrachlorophenol			20.0	19.8		ug/L		99	50 - 150	9	30
4-Chloro-3-methylphenol			20.0	17.5		ug/L		88	45 - 120	6	30
4-Chlorophenyl phenyl ether			20.0	17.9		ug/L		89	47 - 120	10	30
Bis(2-ethylhexyl) phthalate			20.0	16.4		ug/L		82	21 - 125	4	30
Butyl benzyl phthalate			20.0	17.4		ug/L		87	51 - 120	4	30
Di-n-butyl phthalate			20.0	19.8		ug/L		99	57 - 122	9	30
Isophorone			20.0	16.9		ug/L		84	48 - 123	4	30
Phenol			20.0	9.35		ug/L		47	16 - 120	6	30
2,6-Dinitrotoluene			20.0	19.1		ug/L		96	52 - 120	9	30
Diethyl phthalate			20.0	18.1		ug/L		90	58 - 120	7	30
Indeno[1,2,3-cd]pyrene			20.0	20.6		ug/L		103	25 - 120	8	30
2,4,6-Trichlorophenol			20.0	18.0		ug/L		90	43 - 120	7	30
2,4,5-Trichlorophenol			20.0	18.6		ug/L		93	47 - 120	9	30
Nitrobenzene			20.0	16.8		ug/L		84	41 - 120	3	30
Anthracene			20.0	17.3		ug/L		86	56 - 120	8	30
Bis(2-chloroethyl)ether			20.0	16.0		ug/L		80	43 - 120	2	30
2-Chloronaphthalene			20.0	16.3		ug/L		82	47 - 120	8	30
2,4-Dinitrophenol			40.0	34.3		ug/L		86	10 - 120	8	30
4-Nitrophenol			40.0	25.0		ug/L		63	16 - 120	2	30
Acetophenone			20.0	17.0		ug/L		85	50 - 120	0	30
1,2-Dichlorobenzene			20.0	13.1		ug/L		66	52 - 110	2	30
3,3'-Dichlorobenzidine			40.0	36.9		ug/L		92	29 - 120	6	30
Hexachloroethane			20.0	11.6		ug/L		58	42 - 120	3	30
Dimethyl phthalate			20.0	18.3		ug/L		92	59 - 120	8	30
Benzophenone			20.0	26.0		ug/L		130	10 - 160	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*79*		*31 - 115*
2-Fluorobiphenyl (Surr)	*81*		*29 - 110*
2,4,6-Tribromophenol	*101*		*21 - 128*
Nitrobenzene-d5	*81*		*31 - 110*
Phenol-d5	*45*		*10 - 110*
2-Fluorophenol	*60*		*15 - 110*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-174965/7-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174965

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.20	0.045	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Nitrophenol	ND		2.0	0.28	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzaldehyde	ND		1.0	0.39	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4-Dimethylphenol	ND		2.0	0.25	ug/L		04/03/15 07:48	04/06/15 09:30	1
Fluorene	ND		0.20	0.041	ug/L		04/03/15 07:48	04/06/15 09:30	1
Di-n-octyl phthalate	ND		2.0	0.23	ug/L		04/03/15 07:48	04/06/15 09:30	1
Carbazole	ND		1.0	0.28	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzyl alcohol	ND		5.0	0.38	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzo[a]pyrene	ND		0.20	0.051	ug/L		04/03/15 07:48	04/06/15 09:30	1
3 & 4 Methylphenol	ND		2.0	0.80	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Nitroaniline	ND		2.0	0.22	ug/L		04/03/15 07:48	04/06/15 09:30	1
Aniline	ND		5.0	0.34	ug/L		04/03/15 07:48	04/06/15 09:30	1
Bis(2-chloroethoxy)methane	ND		1.0	0.32	ug/L		04/03/15 07:48	04/06/15 09:30	1
N-Nitrosodiphenylamine	ND		1.0	0.31	ug/L		04/03/15 07:48	04/06/15 09:30	1
Acenaphthylene	ND		0.20	0.048	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Chlorophenol	ND		1.0	0.29	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Bromophenyl phenyl ether	ND		2.0	0.22	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Nitroaniline	ND		2.0	0.21	ug/L		04/03/15 07:48	04/06/15 09:30	1
Pentachlorophenol	ND		5.0	0.27	ug/L		04/03/15 07:48	04/06/15 09:30	1
Dibenzofuran	ND		1.0	0.020	ug/L		04/03/15 07:48	04/06/15 09:30	1
Hexachlorocyclopentadiene	ND		10	0.24	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzo[a]anthracene	ND		0.20	0.030	ug/L		04/03/15 07:48	04/06/15 09:30	1
Chrysene	ND		0.20	0.050	ug/L		04/03/15 07:48	04/06/15 09:30	1
4,6-Dinitro-2-methylphenol	ND		5.0	2.4	ug/L		04/03/15 07:48	04/06/15 09:30	1
1,2,4,5-Tetrachlorobenzene	ND		1.0	0.55	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Chloroaniline	ND		2.0	0.21	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4-Dinitrotoluene	ND		5.0	0.25	ug/L		04/03/15 07:48	04/06/15 09:30	1
1-Methylnaphthalene	0.264		0.20	0.034	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzo[k]fluoranthene	ND		0.20	0.045	ug/L		04/03/15 07:48	04/06/15 09:30	1
Azobenzene	ND		10	0.29	ug/L		04/03/15 07:48	04/06/15 09:30	1
Atrazine	ND		1.0	0.34	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzo[g,h,i]perylene	ND		0.20	0.046	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4-Dichlorophenol	ND		2.0	0.19	ug/L		04/03/15 07:48	04/06/15 09:30	1
Phenanthrene	ND		0.20	0.062	ug/L		04/03/15 07:48	04/06/15 09:30	1
Caprolactam	ND		5.0	0.20	ug/L		04/03/15 07:48	04/06/15 09:30	1
3-Nitroaniline	ND		2.0	0.28	ug/L		04/03/15 07:48	04/06/15 09:30	1
Fluoranthene	ND		0.20	0.045	ug/L		04/03/15 07:48	04/06/15 09:30	1
1,1'-Biphenyl	ND		1.0	0.13	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzo[b]fluoranthene	ND		0.20	0.039	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Methylphenol	ND		1.0	0.17	ug/L		04/03/15 07:48	04/06/15 09:30	1
N-Nitrosodi-n-propylamine	ND		1.0	0.24	ug/L		04/03/15 07:48	04/06/15 09:30	1
Pyrene	ND		0.20	0.042	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzoic acid	ND		25	10	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Methylnaphthalene	0.425		0.20	0.090	ug/L		04/03/15 07:48	04/06/15 09:30	1
Hexachlorobenzene	ND		0.20	0.085	ug/L		04/03/15 07:48	04/06/15 09:30	1
Acenaphthene	ND		0.20	0.044	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,2'-oxybis[1-chloropropane]	ND		1.0	0.40	ug/L		04/03/15 07:48	04/06/15 09:30	1
Phenyl ether	ND		10	1.2	ug/L		04/03/15 07:48	04/06/15 09:30	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-174965/7-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 174965

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,4,6-Tetrachlorophenol	ND		10	0.58	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Chloro-3-methylphenol	ND		2.0	0.21	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Chlorophenyl phenyl ether	ND		2.0	0.30	ug/L		04/03/15 07:48	04/06/15 09:30	1
Bis(2-ethylhexyl) phthalate	ND		5.0	1.7	ug/L		04/03/15 07:48	04/06/15 09:30	1
Butyl benzyl phthalate	ND		2.0	0.26	ug/L		04/03/15 07:48	04/06/15 09:30	1
Di-n-butyl phthalate	ND		5.0	1.7	ug/L		04/03/15 07:48	04/06/15 09:30	1
Isophorone	ND		1.0	0.27	ug/L		04/03/15 07:48	04/06/15 09:30	1
Phenol	ND		1.0	0.60	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,6-Dinitrotoluene	ND		5.0	0.80	ug/L		04/03/15 07:48	04/06/15 09:30	1
Diethyl phthalate	ND		2.0	0.60	ug/L		04/03/15 07:48	04/06/15 09:30	1
Indeno[1,2,3-cd]pyrene	ND		0.20	0.043	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4,6-Trichlorophenol	ND		5.0	0.24	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4,5-Trichlorophenol	ND		5.0	0.30	ug/L		04/03/15 07:48	04/06/15 09:30	1
Nitrobenzene	ND		1.0	0.040	ug/L		04/03/15 07:48	04/06/15 09:30	1
Anthracene	ND		0.20	0.088	ug/L		04/03/15 07:48	04/06/15 09:30	1
Bis(2-chloroethyl)ether	ND		1.0	0.10	ug/L		04/03/15 07:48	04/06/15 09:30	1
2-Chloronaphthalene	ND		1.0	0.10	ug/L		04/03/15 07:48	04/06/15 09:30	1
2,4-Dinitrophenol	ND		5.0	0.32	ug/L		04/03/15 07:48	04/06/15 09:30	1
4-Nitrophenol	ND		5.0	0.29	ug/L		04/03/15 07:48	04/06/15 09:30	1
Acetophenone	ND		1.0	0.34	ug/L		04/03/15 07:48	04/06/15 09:30	1
1,2-Dichlorobenzene	ND		1.0	0.29	ug/L		04/03/15 07:48	04/06/15 09:30	1
3,3'-Dichlorobenzidine	ND		5.0	0.37	ug/L		04/03/15 07:48	04/06/15 09:30	1
Hexachloroethane	ND		1.0	0.19	ug/L		04/03/15 07:48	04/06/15 09:30	1
Dimethyl phthalate	ND		2.0	0.29	ug/L		04/03/15 07:48	04/06/15 09:30	1
Benzophenone	ND		5.0	5.0	ug/L		04/03/15 07:48	04/06/15 09:30	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown Hydrocarbon	*1.95*	*T J*	*ug/L*		*7.35*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown	*1.14*	*T J*	*ug/L*		*7.73*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown Hydrocarbon	*5.57*	*T J*	*ug/L*		*7.87*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown Hydrocarbon	*4.00*	*T J*	*ug/L*		*8.35*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Naphthalene, 1,6-dimethyl-	*1.28*	*T J N*	*ug/L*		*8.54*	*575-43-9*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown	*3.09*	*T J*	*ug/L*		*8.62*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown Hydrocarbon	*2.58*	*T J*	*ug/L*		*8.80*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown	*1.09*	*T J*	*ug/L*		*9.09*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Unknown	*1.32*	*T J*	*ug/L*		*11.14*		*04/03/15 07:48*	*04/06/15 09:30*	*1*
Octadecanoic acid	*0.814*	*T J N*	*ug/L*		*11.21*	*57-11-4*	*04/03/15 07:48*	*04/06/15 09:30*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*86*		*31 - 115*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
2-Fluorobiphenyl (Surr)	*79*		*29 - 110*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
2,4,6-Tribromophenol	*80*		*21 - 128*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
Nitrobenzene-d5	*74*		*31 - 110*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
Phenol-d5	*48*		*10 - 110*	*04/03/15 07:48*	*04/06/15 09:30*	*1*
2-Fluorophenol	*62*		*15 - 110*	*04/03/15 07:48*	*04/06/15 09:30*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-174965/8-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174965

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	20.0	20.1		ug/L		101	24 - 125
2-Nitrophenol	20.0	15.7		ug/L		78	42 - 120
Benzaldehyde	40.0	33.8		ug/L		84	40 - 122
2,4-Dimethylphenol	20.0	15.8		ug/L		79	38 - 120
Fluorene	20.0	16.1		ug/L		80	56 - 120
Di-n-octyl phthalate	20.0	16.5		ug/L		82	21 - 122
Carbazole	20.0	17.2		ug/L		86	57 - 120
Benzyl alcohol	20.0	13.8		ug/L		69	23 - 110
Benzo[a]pyrene	20.0	17.4		ug/L		87	24 - 120
3 & 4 Methylphenol	20.0	13.8		ug/L		69	34 - 120
4-Nitroaniline	20.0	19.2		ug/L		96	48 - 120
Aniline	20.0	12.5		ug/L		62	10 - 123
Bis(2-chloroethoxy)methane	20.0	16.7		ug/L		84	48 - 120
N-Nitrosodiphenylamine	40.0	32.3		ug/L		81	51 - 120
Acenaphthylene	20.0	15.5		ug/L		77	55 - 120
2-Chlorophenol	20.0	13.8		ug/L		69	43 - 120
4-Bromophenyl phenyl ether	20.0	17.4		ug/L		87	47 - 120
2-Nitroaniline	20.0	21.0		ug/L		105	48 - 127
Pentachlorophenol	40.0	32.0		ug/L		80	14 - 120
Dibenzofuran	20.0	16.5		ug/L		83	56 - 120
Hexachlorocyclopentadiene	20.0	14.2		ug/L		71	4 - 120
Benzo[a]anthracene	20.0	16.6		ug/L		83	46 - 120
Chrysene	20.0	17.9		ug/L		89	49 - 120
4,6-Dinitro-2-methylphenol	40.0	31.6		ug/L		79	33 - 120
1,2,4,5-Tetrachlorobenzene	20.0	17.2		ug/L		86	40 - 160
4-Chloroaniline	20.0	15.0		ug/L		75	15 - 120
2,4-Dinitrotoluene	20.0	17.7		ug/L		89	52 - 120
1-Methylnaphthalene	20.0	16.9		ug/L		85	54 - 110
Benzo[k]fluoranthene	20.0	18.8		ug/L		94	30 - 120
Azobenzene	20.0	26.0		ug/L		130	50 - 150
Atrazine	40.0	35.0		ug/L		87	65 - 161
Benzo[g,h,i]perylene	20.0	20.9		ug/L		105	24 - 126
2,4-Dichlorophenol	20.0	15.9		ug/L		80	46 - 120
Phenanthrene	20.0	16.3		ug/L		81	57 - 120
Caprolactam	40.0	16.9		ug/L		42	10 - 120
3-Nitroaniline	20.0	18.3		ug/L		92	52 - 120
Fluoranthene	20.0	17.7		ug/L		88	57 - 120
1,1'-Biphenyl	20.0	16.3		ug/L		81	52 - 120
Benzo[b]fluoranthene	20.0	16.7		ug/L		83	24 - 120
2-Methylphenol	20.0	13.7		ug/L		68	38 - 120
N-Nitrosodi-n-propylamine	20.0	16.4		ug/L		82	48 - 123
Pyrene	20.0	18.3		ug/L		91	50 - 120
Benzoic acid	40.0	ND		ug/L		21	10 - 110
2-Methylnaphthalene	20.0	16.1		ug/L		81	52 - 120
Hexachlorobenzene	20.0	17.5		ug/L		88	52 - 120
Acenaphthene	20.0	16.1		ug/L		80	55 - 120
2,2'-oxybis[1-chloropropane]	20.0	14.8		ug/L		74	42 - 120
Phenyl ether	20.0	17.2		ug/L		86	40 - 160

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-174965/8-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 174965

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,4,6-Tetrachlorophenol	20.0	18.3		ug/L		92	50 - 150
4-Chloro-3-methylphenol	20.0	17.1		ug/L		85	45 - 120
4-Chlorophenyl phenyl ether	20.0	17.0		ug/L		85	47 - 120
Bis(2-ethylhexyl) phthalate	20.0	18.0		ug/L		90	21 - 125
Butyl benzyl phthalate	20.0	18.0		ug/L		90	51 - 120
Di-n-butyl phthalate	20.0	19.5		ug/L		98	57 - 122
Isophorone	20.0	16.3		ug/L		82	48 - 123
Phenol	20.0	8.59		ug/L		43	16 - 120
2,6-Dinitrotoluene	20.0	18.4		ug/L		92	52 - 120
Diethyl phthalate	20.0	18.3		ug/L		91	58 - 120
Indeno[1,2,3-cd]pyrene	20.0	20.2		ug/L		101	25 - 120
2,4,6-Trichlorophenol	20.0	17.2		ug/L		86	43 - 120
2,4,5-Trichlorophenol	20.0	17.6		ug/L		88	47 - 120
Nitrobenzene	20.0	15.2		ug/L		76	41 - 120
Anthracene	20.0	16.5		ug/L		83	56 - 120
Bis(2-chloroethyl)ether	20.0	14.8		ug/L		74	43 - 120
2-Chloronaphthalene	20.0	16.3		ug/L		81	47 - 120
2,4-Dinitrophenol	40.0	26.9		ug/L		67	10 - 120
4-Nitrophenol	40.0	24.4		ug/L		61	16 - 120
Acetophenone	20.0	15.7		ug/L		78	50 - 120
1,2-Dichlorobenzene	20.0	12.7		ug/L		64	52 - 110
3,3'-Dichlorobenzidine	40.0	37.2		ug/L		93	29 - 120
Hexachloroethane	20.0	13.5		ug/L		68	42 - 120
Dimethyl phthalate	20.0	17.8		ug/L		89	59 - 120
Benzophenone	20.0	25.1		ug/L		125	10 - 160

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*87*		*31 - 115*
2-Fluorobiphenyl (Surr)	*84*		*29 - 110*
2,4,6-Tribromophenol	*101*		*21 - 128*
Nitrobenzene-d5	*78*		*31 - 110*
Phenol-d5	*43*		*10 - 110*
2-Fluorophenol	*51*		*15 - 110*

Lab Sample ID: LCSD 240-174965/9-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174965

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibenz(a,h)anthracene	20.0	19.6		ug/L		98	24 - 125	2	30
2-Nitrophenol	20.0	15.5		ug/L		77	42 - 120	1	30
Benzaldehyde	40.0	34.4		ug/L		86	40 - 122	2	30
2,4-Dimethylphenol	20.0	14.4		ug/L		72	38 - 120	10	30
Fluorene	20.0	16.3		ug/L		81	56 - 120	1	30
Di-n-octyl phthalate	20.0	16.0		ug/L		80	21 - 122	3	30
Carbazole	20.0	16.8		ug/L		84	57 - 120	3	30
Benzyl alcohol	20.0	13.8		ug/L		69	23 - 110	0	30
Benzo[a]pyrene	20.0	16.9		ug/L		85	24 - 120	3	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-174965/9-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174965

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
3 & 4 Methylphenol	20.0	13.6		ug/L		68	34 - 120	2	30
4-Nitroaniline	20.0	18.7		ug/L		94	48 - 120	3	30
Aniline	20.0	12.9		ug/L		64	10 - 123	3	30
Bis(2-chloroethoxy)methane	20.0	16.3		ug/L		81	48 - 120	3	30
N-Nitrosodiphenylamine	40.0	32.1		ug/L		80	51 - 120	1	30
Acenaphthylene	20.0	15.5		ug/L		77	55 - 120	0	30
2-Chlorophenol	20.0	13.6		ug/L		68	43 - 120	1	30
4-Bromophenyl phenyl ether	20.0	17.2		ug/L		86	47 - 120	1	30
2-Nitroaniline	20.0	20.6		ug/L		103	48 - 127	2	30
Pentachlorophenol	40.0	31.2		ug/L		78	14 - 120	2	30
Dibenzofuran	20.0	16.6		ug/L		83	56 - 120	0	30
Hexachlorocyclopentadiene	20.0	13.7		ug/L		69	4 - 120	4	30
Benzo[a]anthracene	20.0	16.2		ug/L		81	46 - 120	2	30
Chrysene	20.0	17.6		ug/L		88	49 - 120	2	30
4,6-Dinitro-2-methylphenol	40.0	30.7		ug/L		77	33 - 120	3	30
1,2,4,5-Tetrachlorobenzene	20.0	16.8		ug/L		84	40 - 160	3	30
4-Chloroaniline	20.0	14.9		ug/L		74	15 - 120	1	30
2,4-Dinitrotoluene	20.0	17.6		ug/L		88	52 - 120	1	30
1-Methylnaphthalene	20.0	17.1		ug/L		86	54 - 110	1	30
Benzo[k]fluoranthene	20.0	17.4		ug/L		87	30 - 120	7	30
Azobenzene	20.0	25.6		ug/L		128	50 - 150	2	30
Atrazine	40.0	34.5		ug/L		86	65 - 161	1	30
Benzo[g,h,i]perylene	20.0	20.1		ug/L		100	24 - 126	4	30
2,4-Dichlorophenol	20.0	16.0		ug/L		80	46 - 120	0	30
Phenanthrene	20.0	15.9		ug/L		79	57 - 120	2	30
Caprolactam	40.0	15.9		ug/L		40	10 - 120	6	30
3-Nitroaniline	20.0	17.7		ug/L		89	52 - 120	3	30
Fluoranthene	20.0	17.4		ug/L		87	57 - 120	2	30
1,1'-Biphenyl	20.0	16.1		ug/L		81	52 - 120	1	30
Benzo[b]fluoranthene	20.0	17.3		ug/L		86	24 - 120	4	30
2-Methylphenol	20.0	13.8		ug/L		69	38 - 120	1	30
N-Nitrosodi-n-propylamine	20.0	16.6		ug/L		83	48 - 123	1	30
Pyrene	20.0	17.8		ug/L		89	50 - 120	3	30
Benzoic acid	40.0	ND		ug/L		21	10 - 110	2	30
2-Methylnaphthalene	20.0	16.2		ug/L		81	52 - 120	0	30
Hexachlorobenzene	20.0	16.3		ug/L		81	52 - 120	7	30
Acenaphthene	20.0	16.1		ug/L		81	55 - 120	0	30
2,2'-oxybis[1-chloropropane]	20.0	14.8		ug/L		74	42 - 120	0	30
Phenyl ether	20.0	16.7		ug/L		84	40 - 160	2	30
2,3,4,6-Tetrachlorophenol	20.0	18.2		ug/L		91	50 - 150	1	30
4-Chloro-3-methylphenol	20.0	17.1		ug/L		86	45 - 120	0	30
4-Chlorophenyl phenyl ether	20.0	17.2		ug/L		86	47 - 120	1	30
Bis(2-ethylhexyl) phthalate	20.0	17.1		ug/L		85	21 - 125	5	30
Butyl benzyl phthalate	20.0	17.3		ug/L		87	51 - 120	4	30
Di-n-butyl phthalate	20.0	19.0		ug/L		95	57 - 122	3	30
Isophorone	20.0	16.3		ug/L		82	48 - 123	0	30
Phenol	20.0	8.27		ug/L		41	16 - 120	4	30
2,6-Dinitrotoluene	20.0	17.7		ug/L		88	52 - 120	4	30

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-174965/9-A
Matrix: Water
Analysis Batch: 175181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 174965

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diethyl phthalate			20.0	18.2		ug/L		91	58 - 120	0	30
Indeno[1,2,3-cd]pyrene			20.0	19.7		ug/L		98	25 - 120	3	30
2,4,6-Trichlorophenol			20.0	17.1		ug/L		86	43 - 120	0	30
2,4,5-Trichlorophenol			20.0	17.8		ug/L		89	47 - 120	1	30
Nitrobenzene			20.0	15.4		ug/L		77	41 - 120	1	30
Anthracene			20.0	15.9		ug/L		80	56 - 120	4	30
Bis(2-chloroethyl)ether			20.0	14.8		ug/L		74	43 - 120	0	30
2-Chloronaphthalene			20.0	16.3		ug/L		82	47 - 120	0	30
2,4-Dinitrophenol			40.0	26.8		ug/L		67	10 - 120	1	30
4-Nitrophenol			40.0	24.1		ug/L		60	16 - 120	2	30
Acetophenone			20.0	16.0		ug/L		80	50 - 120	2	30
1,2-Dichlorobenzene			20.0	13.4		ug/L		67	52 - 110	5	30
3,3'-Dichlorobenzidine			40.0	38.1		ug/L		95	29 - 120	3	30
Hexachloroethane			20.0	13.2		ug/L		66	42 - 120	2	30
Dimethyl phthalate			20.0	17.3		ug/L		86	59 - 120	3	30
Benzophenone			20.0	24.5		ug/L		122	10 - 160	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*81*		*31 - 115*
2-Fluorobiphenyl (Surr)	*83*		*29 - 110*
2,4,6-Tribromophenol	*99*		*21 - 128*
Nitrobenzene-d5	*76*		*31 - 110*
Phenol-d5	*42*		*10 - 110*
2-Fluorophenol	*50*		*15 - 110*

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Lab Sample ID: MB 320-69743/1-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69743

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		03/30/15 11:03	04/03/15 14:54	1
N-Nitrosodimethylamine	ND		2.0	0.39	ng/L		03/30/15 11:03	04/03/15 14:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*41*		*25 - 150*	*03/30/15 11:03*	*04/03/15 14:54*	*1*
N-Nitrosodi-n-propylamine-d14	*79*		*25 - 150*	*03/30/15 11:03*	*04/03/15 14:54*	*1*

Lab Sample ID: LCS 320-69743/2-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69743

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
N-Nitrosodi-n-propylamine			20.0	21.4	E	ng/L		107	53 - 166		
N-Nitrosodimethylamine			20.0	20.0		ng/L		100	58 - 150		

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS (Continued)

Lab Sample ID: LCS 320-69743/2-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69743

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
N-Nitrosodimethylamine-d6	42		25 - 150
N-Nitrosodi-n-propylamine-d14	93		25 - 150

Lab Sample ID: MB 320-69880/1-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69880

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		03/31/15 11:25	04/03/15 21:54	1
N-Nitrosodimethylamine	ND		2.0	0.39	ng/L		03/31/15 11:25	04/03/15 21:54	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
N-Nitrosodimethylamine-d6	41		25 - 150	03/31/15 11:25	04/03/15 21:54	1
N-Nitrosodi-n-propylamine-d14	96		25 - 150	03/31/15 11:25	04/03/15 21:54	1

Lab Sample ID: LCS 320-69880/2-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69880

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodi-n-propylamine	20.0	23.2	E	ng/L		116	53 - 166
N-Nitrosodimethylamine	20.0	20.7		ng/L		104	58 - 150

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
N-Nitrosodimethylamine-d6	42		25 - 150
N-Nitrosodi-n-propylamine-d14	91		25 - 150

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 680-376322/2
Matrix: Water
Analysis Batch: 376322

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			03/26/15 14:11	1
Sulfate	ND		1.0	0.40	mg/L			03/26/15 14:11	1

Lab Sample ID: LCS 680-376322/3
Matrix: Water
Analysis Batch: 376322

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.3		mg/L		103	90 - 110
Sulfate	10.0	10.4		mg/L		104	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 680-376322/4
Matrix: Water
Analysis Batch: 376322

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			10.0	10.3		mg/L		103	90 - 110	0	30
Sulfate			10.0	10.4		mg/L		104	90 - 110	0	30

Lab Sample ID: 240-48587-11 MS
Matrix: Water
Analysis Batch: 376322

Client Sample ID: OC-M24L64
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	130		40.0	172		mg/L		101	80 - 120
Sulfate	16		40.0	56.8		mg/L		101	80 - 120

Lab Sample ID: 240-48587-11 MSD
Matrix: Water
Analysis Batch: 376322

Client Sample ID: OC-M24L64
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	130		40.0	170		mg/L		97	80 - 120	1	30
Sulfate	16		40.0	55.5		mg/L		98	80 - 120	2	30

Lab Sample ID: MB 680-376449/2
Matrix: Water
Analysis Batch: 376449

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			03/27/15 11:25	1
Sulfate	ND		1.0	0.40	mg/L			03/27/15 11:25	1

Lab Sample ID: LCS 680-376449/3
Matrix: Water
Analysis Batch: 376449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride			10.0	10.3		mg/L		103	90 - 110
Sulfate			10.0	10.6		mg/L		106	90 - 110

Lab Sample ID: LCSD 680-376449/4
Matrix: Water
Analysis Batch: 376449

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			10.0	10.3		mg/L		103	90 - 110	0	30
Sulfate			10.0	10.6		mg/L		106	90 - 110	0	30

Lab Sample ID: MB 680-376499/2
Matrix: Water
Analysis Batch: 376499

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.0	0.40	mg/L			03/28/15 09:57	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 680-376499/3
Matrix: Water
Analysis Batch: 376499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	10.6		mg/L		106	90 - 110

Lab Sample ID: LCSD 680-376499/4
Matrix: Water
Analysis Batch: 376499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	10.6		mg/L		106	90 - 110	0	30

Lab Sample ID: MB 680-376755/2
Matrix: Water
Analysis Batch: 376755

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.20	mg/L			03/30/15 12:45	1

Lab Sample ID: LCS 680-376755/3
Matrix: Water
Analysis Batch: 376755

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.4		mg/L		104	90 - 110

Lab Sample ID: LCSD 680-376755/4
Matrix: Water
Analysis Batch: 376755

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	10.4		mg/L		104	90 - 110	0	30

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 240-173807/1-A
Matrix: Water
Analysis Batch: 174197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 173807

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		03/26/15 10:00	03/27/15 08:40	1
Sodium	ND		5000	180	ug/L		03/26/15 10:00	03/27/15 08:40	1

Lab Sample ID: LCS 240-173807/2-A
Matrix: Water
Analysis Batch: 174197

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 173807

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	199		ug/L		99	80 - 120
Sodium	50000	49600		ug/L		99	80 - 120

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 240-173807/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174197 — **Prep Batch: 173807**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			200	200		ug/L		100	80 - 120	1	20
Sodium			50000	49600		ug/L		99	80 - 120	0	20

Lab Sample ID: 240-48587-5 MS — **Client Sample ID: OC-M15L2C**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174197 — **Prep Batch: 173807**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	1.4	J	200	197		ug/L		98	75 - 125
Sodium	21000		50000	70700		ug/L		99	75 - 125

Lab Sample ID: 240-48587-5 MSD — **Client Sample ID: OC-M15L2C**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174197 — **Prep Batch: 173807**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	1.4	J	200	201		ug/L		100	75 - 125	2	20
Sodium	21000		50000	70800		ug/L		100	75 - 125	0	20

Lab Sample ID: MB 240-174296/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174569 — **Prep Batch: 174296**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		10	0.55	ug/L		03/30/15 11:41	03/31/15 08:33	1
Sodium	ND		5000	180	ug/L		03/30/15 11:41	03/31/15 08:33	1

Lab Sample ID: LCS 240-174296/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174569 — **Prep Batch: 174296**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium			200	205		ug/L		102	80 - 120
Sodium			50000	50500		ug/L		101	80 - 120

Lab Sample ID: LCSD 240-174296/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174569 — **Prep Batch: 174296**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			200	206		ug/L		103	80 - 120	1	20
Sodium			50000	51500		ug/L		103	80 - 120	2	20

Lab Sample ID: 240-48655-2 MS — **Client Sample ID: OC-M24L94**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 174569 — **Prep Batch: 174296**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	ND		200	205		ug/L		103	75 - 125

Method: 6010 - Metals (ICP) (Continued)

Lab Sample ID: 240-48655-2 MS
Matrix: Water
Analysis Batch: 174569

Client Sample ID: OC-M24L94
Prep Type: Total Recoverable
Prep Batch: 174296

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	59000		50000	110000		ug/L		102	75 - 125

Lab Sample ID: 240-48655-2 MSD
Matrix: Water
Analysis Batch: 174569

Client Sample ID: OC-M24L94
Prep Type: Total Recoverable
Prep Batch: 174296

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	ND		200	204		ug/L		102	75 - 125	1	20
Sodium	59000		50000	108000		ug/L		98	75 - 125	2	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 680-376250/1-A
Matrix: Water
Analysis Batch: 376284

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376250

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		03/26/15 11:41	03/26/15 16:41	1

Lab Sample ID: LCS 680-376250/2-A
Matrix: Water
Analysis Batch: 376284

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376250

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.01		mg/L		101	90 - 110

Lab Sample ID: LCSD 680-376250/3-A
Matrix: Water
Analysis Batch: 376284

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 376250

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	1.00	1.02		mg/L		102	90 - 110	1	30

Lab Sample ID: 240-48587-5 DU
Matrix: Water
Analysis Batch: 376284

Client Sample ID: OC-M15L2C
Prep Type: Total/NA
Prep Batch: 376250

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Ammonia	ND		ND		mg/L		NC	30

Lab Sample ID: MB 680-377070/1-A
Matrix: Water
Analysis Batch: 377123

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 377070

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.25	0.10	mg/L		04/01/15 11:40	04/01/15 15:29	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 680-377070/2-A
Matrix: Water
Analysis Batch: 377123

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 377070

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.06		mg/L		106	90 - 110

Lab Sample ID: LCSD 680-377070/3-A
Matrix: Water
Analysis Batch: 377123

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 377070

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	1.00	1.10		mg/L		110	90 - 110	4	30

Lab Sample ID: 240-48655-2 MS
Matrix: Water
Analysis Batch: 377123

Client Sample ID: OC-M24L94
Prep Type: Total/NA
Prep Batch: 377070

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	ND	F1	1.00	1.11	F1	mg/L		111	90 - 110

Lab Sample ID: 240-48655-2 MSD
Matrix: Water
Analysis Batch: 377123

Client Sample ID: OC-M24L94
Prep Type: Total/NA
Prep Batch: 377070

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	ND	F1	1.00	1.03		mg/L		103	90 - 110	8	30

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 680-376380/13
Matrix: Water
Analysis Batch: 376380

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.010	mg/L			03/25/15 18:03	1

Lab Sample ID: LCS 680-376380/16
Matrix: Water
Analysis Batch: 376380

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.500	0.496		mg/L		99	90 - 110

Lab Sample ID: 240-48587-5 MS
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	ND		0.500	0.506		mg/L		101	90 - 110

Method: 353.2 - Nitrogen, Nitrite (Continued)

Lab Sample ID: 240-48587-5 MSD
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as N	ND		0.500	0.507		mg/L		101	90 - 110	0	10

Lab Sample ID: 240-48587-6 DU
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrite as N	ND		ND		mg/L		NC	10

Lab Sample ID: MB 680-376381/13
Matrix: Water
Analysis Batch: 376381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		0.050	0.010	mg/L			03/26/15 16:29	1

Lab Sample ID: LCS 680-376381/16
Matrix: Water
Analysis Batch: 376381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.500	0.500		mg/L		100	90 - 110

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: 240-48587-5 MS
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.022	J	1.00	1.05		mg/L		103	90 - 110
Nitrite as N	ND		0.500	0.506		mg/L		101	90 - 110

Lab Sample ID: 240-48587-5 MSD
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M15L2C
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.022	J	1.00	1.04		mg/L		102	90 - 110	0	10
Nitrite as N	ND		0.500	0.507		mg/L		101	90 - 110	0	10

Lab Sample ID: 240-48587-6 DU
Matrix: Water
Analysis Batch: 376380

Client Sample ID: OC-M02L07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	0.81		0.803		mg/L		0.6	30

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 360-99796/9
Matrix: Water
Analysis Batch: 99796

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/26/15 11:16	1

Lab Sample ID: LCS 360-99796/10
Matrix: Water
Analysis Batch: 99796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium (hexavalent)			0.0507	0.0492		mg/L		97	80 - 120		

Lab Sample ID: LCSD 360-99796/11
Matrix: Water
Analysis Batch: 99796

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)			0.0507	0.0492		mg/L		97	80 - 120	0	20

Lab Sample ID: 240-48655-2 MS
Matrix: Water
Analysis Batch: 99796

Client Sample ID: OC-M24L94
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium (hexavalent)	ND		0.0250	0.0242		mg/L		97	85 - 115		

Lab Sample ID: 240-48655-2 MSD
Matrix: Water
Analysis Batch: 99796

Client Sample ID: OC-M24L94
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	ND		0.0250	0.0254		mg/L		102	85 - 115	5	20

Lab Sample ID: MB 360-99797/10
Matrix: Water
Analysis Batch: 99797

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			03/25/15 08:45	1

Lab Sample ID: LCS 360-99797/11
Matrix: Water
Analysis Batch: 99797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium (hexavalent)			0.0507	0.0510		mg/L		101	80 - 120		

Lab Sample ID: LCSD 360-99797/12
Matrix: Water
Analysis Batch: 99797

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)			0.0507	0.0510		mg/L		101	80 - 120	0	20

Lab Sample ID: 240-48587-15 MS
Matrix: Water
Analysis Batch: 99797

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chromium (hexavalent)	ND		0.0250	0.0207		mg/L		83	85 - 115		

Lab Sample ID: 240-48587-15 MSD
Matrix: Water
Analysis Batch: 99797

Client Sample ID: OC-M24L54
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	ND		0.0250	0.0207		mg/L		83	85 - 115	0	20

GC/MS Semi VOA

Prep Batch: 69743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-1	OC-M03L07	Total/NA	Water	3510C	
240-48587-2	OC-M03L02	Total/NA	Water	3510C	
240-48587-3	OC-M03L2D	Total/NA	Water	3510C	
240-48587-4	OC-M03L2F	Total/NA	Water	3510C	
240-48587-5	OC-M15L2C	Total/NA	Water	3510C	
240-48587-6	OC-M02L07	Total/NA	Water	3510C	
240-48587-7	OC-M01L6C	Total/NA	Water	3510C	
240-48587-8	OC-M14L2B	Total/NA	Water	3510C	
240-48587-9	OC-M24L65	Total/NA	Water	3510C	
LCS 320-69743/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-69743/1-A	Method Blank	Total/NA	Water	3510C	

Prep Batch: 69880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-10	OC-M24L72A	Total/NA	Water	3510C	
240-48587-11	OC-M24L64	Total/NA	Water	3510C	
240-48587-12	OC-M24L116	Total/NA	Water	3510C	
240-48587-13	OC-M24L63	Total/NA	Water	3510C	
240-48587-14	OC-M24L66	Total/NA	Water	3510C	
240-48587-15	OC-M24L54	Total/NA	Water	3510C	
240-48655-1	OC-M01L6D	Total/NA	Water	3510C	
240-48655-2	OC-M24L94	Total/NA	Water	3510C	
LCS 320-69880/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-69880/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 70283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-1	OC-M03L07	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-2	OC-M03L02	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-3	OC-M03L2D	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-4	OC-M03L2F	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-5	OC-M15L2C	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-6	OC-M02L07	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-7	OC-M01L6C	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-8	OC-M14L2B	Total/NA	Water	GCMSMS_NDMA	69743
240-48587-9	OC-M24L65	Total/NA	Water	GCMSMS_NDMA	69743
240-48655-1	OC-M01L6D	Total/NA	Water	GCMSMS_NDMA	69880
240-48655-2	OC-M24L94	Total/NA	Water	GCMSMS_NDMA	69880
LCS 320-69743/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	69743
LCS 320-69880/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	69880

GC/MS Semi VOA (Continued)

Analysis Batch: 70283 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-69743/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	69743
MB 320-69880/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	69880

Analysis Batch: 70463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-10	OC-M24L72A	Total/NA	Water	GCMSMS_NDMA	69880
240-48587-11	OC-M24L64	Total/NA	Water	GCMSMS_NDMA	69880
240-48587-12	OC-M24L116	Total/NA	Water	GCMSMS_NDMA	69880
240-48587-13	OC-M24L63	Total/NA	Water	GCMSMS_NDMA	69880
240-48587-14	OC-M24L66	Total/NA	Water	GCMSMS_NDMA	69880
240-48587-15	OC-M24L54	Total/NA	Water	GCMSMS_NDMA	69880

Prep Batch: 173777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	3510C	
240-48587-6	OC-M02L07	Total/NA	Water	3510C	
240-48587-11	OC-M24L64	Total/NA	Water	3510C	
240-48587-13	OC-M24L63	Total/NA	Water	3510C	
240-48587-15	OC-M24L54	Total/NA	Water	3510C	
LCS 240-173777/15-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-173777/16-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-173777/14-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 174402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	8270D	173777
240-48587-6	OC-M02L07	Total/NA	Water	8270D	173777
240-48587-11	OC-M24L64	Total/NA	Water	8270D	173777
240-48587-13	OC-M24L63	Total/NA	Water	8270D	173777
240-48587-15	OC-M24L54	Total/NA	Water	8270D	173777
LCS 240-173777/15-A	Lab Control Sample	Total/NA	Water	8270D	173777
LCSD 240-173777/16-A	Lab Control Sample Dup	Total/NA	Water	8270D	173777
MB 240-173777/14-A	Method Blank	Total/NA	Water	8270D	173777

Prep Batch: 174423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	3510C	
LCS 240-174423/15-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-174423/16-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-174423/14-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 174592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	8270D	174423
LCS 240-174423/15-A	Lab Control Sample	Total/NA	Water	8270D	174423

GC/MS Semi VOA (Continued)

Analysis Batch: 174592 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 240-174423/16-A	Lab Control Sample Dup	Total/NA	Water	8270D	174423
MB 240-174423/14-A	Method Blank	Total/NA	Water	8270D	174423

Prep Batch: 174965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5 - RE	OC-M15L2C	Total/NA	Water	3510C	
240-48587-11 - RE	OC-M24L64	Total/NA	Water	3510C	
240-48587-13 - RE	OC-M24L63	Total/NA	Water	3510C	
240-48587-15 - RE	OC-M24L54	Total/NA	Water	3510C	
240-48655-2 - RE	OC-M24L94	Total/NA	Water	3510C	
LCS 240-174965/8-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 240-174965/9-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 240-174965/7-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 175181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5 - RE	OC-M15L2C	Total/NA	Water	8270D	174965
240-48587-11 - RE	OC-M24L64	Total/NA	Water	8270D	174965
240-48587-13 - RE	OC-M24L63	Total/NA	Water	8270D	174965
240-48587-15 - RE	OC-M24L54	Total/NA	Water	8270D	174965
240-48655-2 - RE	OC-M24L94	Total/NA	Water	8270D	174965
LCS 240-174965/8-A	Lab Control Sample	Total/NA	Water	8270D	174965
LCSD 240-174965/9-A	Lab Control Sample Dup	Total/NA	Water	8270D	174965
MB 240-174965/7-A	Method Blank	Total/NA	Water	8270D	174965

HPLC/IC

Analysis Batch: 376322

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	300.0	
240-48587-5	OC-M15L2C	Total/NA	Water	300.0	
240-48587-6	OC-M02L07	Total/NA	Water	300.0	
240-48587-8	OC-M14L2B	Total/NA	Water	300.0	
240-48587-9	OC-M24L65	Total/NA	Water	300.0	
240-48587-10	OC-M24L72A	Total/NA	Water	300.0	
240-48587-11	OC-M24L64	Total/NA	Water	300.0	
240-48587-11	OC-M24L64	Total/NA	Water	300.0	
240-48587-11 MS	OC-M24L64	Total/NA	Water	300.0	
240-48587-11 MSD	OC-M24L64	Total/NA	Water	300.0	
240-48587-13	OC-M24L63	Total/NA	Water	300.0	
240-48587-13	OC-M24L63	Total/NA	Water	300.0	
240-48587-14	OC-M24L66	Total/NA	Water	300.0	
240-48587-15	OC-M24L54	Total/NA	Water	300.0	
LCS 680-376322/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-376322/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-376322/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 376449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-8	OC-M14L2B	Total/NA	Water	300.0	

HPLC/IC (Continued)

Analysis Batch: 376449 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-9	OC-M24L65	Total/NA	Water	300.0	
240-48587-10	OC-M24L72A	Total/NA	Water	300.0	
LCS 680-376449/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-376449/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-376449/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 376499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	300.0	
LCS 680-376499/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-376499/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-376499/2	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 376755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	300.0	
LCS 680-376755/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-376755/4	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 680-376755/2	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 173807

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total Recoverable	Water	3005A	
240-48587-5 MS	OC-M15L2C	Total Recoverable	Water	3005A	
240-48587-5 MSD	OC-M15L2C	Total Recoverable	Water	3005A	
240-48587-6	OC-M02L07	Total Recoverable	Water	3005A	
240-48587-8	OC-M14L2B	Total Recoverable	Water	3005A	
240-48587-9	OC-M24L65	Total Recoverable	Water	3005A	
240-48587-10	OC-M24L72A	Total Recoverable	Water	3005A	
240-48587-11	OC-M24L64	Total Recoverable	Water	3005A	
240-48587-13	OC-M24L63	Total Recoverable	Water	3005A	
240-48587-14	OC-M24L66	Total Recoverable	Water	3005A	
240-48587-15	OC-M24L54	Total Recoverable	Water	3005A	
LCS 240-173807/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 240-173807/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 240-173807/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 174197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total Recoverable	Water	6010	173807
240-48587-5 MS	OC-M15L2C	Total Recoverable	Water	6010	173807
240-48587-5 MSD	OC-M15L2C	Total Recoverable	Water	6010	173807
240-48587-6	OC-M02L07	Total Recoverable	Water	6010	173807
240-48587-8	OC-M14L2B	Total Recoverable	Water	6010	173807
240-48587-9	OC-M24L65	Total Recoverable	Water	6010	173807
240-48587-10	OC-M24L72A	Total Recoverable	Water	6010	173807
240-48587-11	OC-M24L64	Total Recoverable	Water	6010	173807
240-48587-13	OC-M24L63	Total Recoverable	Water	6010	173807

Metals (Continued)

Analysis Batch: 174197 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-14	OC-M24L66	Total Recoverable	Water	6010	173807
240-48587-15	OC-M24L54	Total Recoverable	Water	6010	173807
LCS 240-173807/2-A	Lab Control Sample	Total Recoverable	Water	6010	173807
LCSD 240-173807/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	173807
MB 240-173807/1-A	Method Blank	Total Recoverable	Water	6010	173807

Prep Batch: 174296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total Recoverable	Water	3005A	
240-48655-2 MS	OC-M24L94	Total Recoverable	Water	3005A	
240-48655-2 MSD	OC-M24L94	Total Recoverable	Water	3005A	
LCS 240-174296/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 240-174296/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 240-174296/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 174569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total Recoverable	Water	6010	174296
240-48655-2 MS	OC-M24L94	Total Recoverable	Water	6010	174296
240-48655-2 MSD	OC-M24L94	Total Recoverable	Water	6010	174296
LCS 240-174296/2-A	Lab Control Sample	Total Recoverable	Water	6010	174296
LCSD 240-174296/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010	174296
MB 240-174296/1-A	Method Blank	Total Recoverable	Water	6010	174296

General Chemistry

Analysis Batch: 99796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	7196A	
240-48655-2 MS	OC-M24L94	Total/NA	Water	7196A	
240-48655-2 MSD	OC-M24L94	Total/NA	Water	7196A	
LCS 360-99796/10	Lab Control Sample	Total/NA	Water	7196A	
LCSD 360-99796/11	Lab Control Sample Dup	Total/NA	Water	7196A	
MB 360-99796/9	Method Blank	Total/NA	Water	7196A	

Analysis Batch: 99797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	7196A	
240-48587-6	OC-M02L07	Total/NA	Water	7196A	
240-48587-8	OC-M14L2B	Total/NA	Water	7196A	
240-48587-11	OC-M24L64	Total/NA	Water	7196A	
240-48587-13	OC-M24L63	Total/NA	Water	7196A	
240-48587-15	OC-M24L54	Total/NA	Water	7196A	
240-48587-15 MS	OC-M24L54	Total/NA	Water	7196A	
240-48587-15 MSD	OC-M24L54	Total/NA	Water	7196A	
LCS 360-99797/11	Lab Control Sample	Total/NA	Water	7196A	
LCSD 360-99797/12	Lab Control Sample Dup	Total/NA	Water	7196A	
MB 360-99797/10	Method Blank	Total/NA	Water	7196A	

General Chemistry (Continued)

Prep Batch: 376250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	Distill/Ammonia	
240-48587-5 DU	OC-M15L2C	Total/NA	Water	Distill/Ammonia	
240-48587-6	OC-M02L07	Total/NA	Water	Distill/Ammonia	
240-48587-8	OC-M14L2B	Total/NA	Water	Distill/Ammonia	
240-48587-9	OC-M24L65	Total/NA	Water	Distill/Ammonia	
240-48587-10	OC-M24L72A	Total/NA	Water	Distill/Ammonia	
240-48587-11	OC-M24L64	Total/NA	Water	Distill/Ammonia	
240-48587-13	OC-M24L63	Total/NA	Water	Distill/Ammonia	
240-48587-14	OC-M24L66	Total/NA	Water	Distill/Ammonia	
240-48587-15	OC-M24L54	Total/NA	Water	Distill/Ammonia	
LCS 680-376250/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
LCSD 680-376250/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/Ammonia	
MB 680-376250/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 376284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	350.1	376250
240-48587-5 DU	OC-M15L2C	Total/NA	Water	350.1	376250
240-48587-6	OC-M02L07	Total/NA	Water	350.1	376250
240-48587-8	OC-M14L2B	Total/NA	Water	350.1	376250
240-48587-9	OC-M24L65	Total/NA	Water	350.1	376250
240-48587-10	OC-M24L72A	Total/NA	Water	350.1	376250
240-48587-11	OC-M24L64	Total/NA	Water	350.1	376250
240-48587-13	OC-M24L63	Total/NA	Water	350.1	376250
240-48587-14	OC-M24L66	Total/NA	Water	350.1	376250
240-48587-15	OC-M24L54	Total/NA	Water	350.1	376250
LCS 680-376250/2-A	Lab Control Sample	Total/NA	Water	350.1	376250
LCSD 680-376250/3-A	Lab Control Sample Dup	Total/NA	Water	350.1	376250
MB 680-376250/1-A	Method Blank	Total/NA	Water	350.1	376250

Analysis Batch: 376380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48587-5	OC-M15L2C	Total/NA	Water	353.2	
240-48587-5 MS	OC-M15L2C	Total/NA	Water	353.2	
240-48587-5 MSD	OC-M15L2C	Total/NA	Water	353.2	
240-48587-6	OC-M02L07	Total/NA	Water	353.2	
240-48587-6 DU	OC-M02L07	Total/NA	Water	353.2	
240-48587-8	OC-M14L2B	Total/NA	Water	353.2	
240-48587-9	OC-M24L65	Total/NA	Water	353.2	
240-48587-10	OC-M24L72A	Total/NA	Water	353.2	
240-48587-11	OC-M24L64	Total/NA	Water	353.2	
240-48587-13	OC-M24L63	Total/NA	Water	353.2	
240-48587-14	OC-M24L66	Total/NA	Water	353.2	
240-48587-15	OC-M24L54	Total/NA	Water	353.2	
LCS 680-376380/16	Lab Control Sample	Total/NA	Water	353.2	
MB 680-376380/13	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 376381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	353.2	
LCS 680-376381/16	Lab Control Sample	Total/NA	Water	353.2	

General Chemistry (Continued)

Analysis Batch: 376381 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-376381/13	Method Blank	Total/NA	Water	353.2	

Prep Batch: 377070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	Distill/Ammonia	
240-48655-2 MS	OC-M24L94	Total/NA	Water	Distill/Ammonia	
240-48655-2 MSD	OC-M24L94	Total/NA	Water	Distill/Ammonia	
LCS 680-377070/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
LCSD 680-377070/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/Ammonia	
MB 680-377070/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 377123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-48655-2	OC-M24L94	Total/NA	Water	350.1	377070
240-48655-2 MS	OC-M24L94	Total/NA	Water	350.1	377070
240-48655-2 MSD	OC-M24L94	Total/NA	Water	350.1	377070
LCS 680-377070/2-A	Lab Control Sample	Total/NA	Water	350.1	377070
LCSD 680-377070/3-A	Lab Control Sample Dup	Total/NA	Water	350.1	377070
MB 680-377070/1-A	Method Blank	Total/NA	Water	350.1	377070

Client Sample ID: OC-M03L07

Lab Sample ID: 240-48587-1

Date Collected: 03/24/15 09:01

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 16:11	VMN	TAL SAC

Client Sample ID: OC-M03L02

Lab Sample ID: 240-48587-2

Date Collected: 03/24/15 08:04

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 16:49	VMN	TAL SAC

Client Sample ID: OC-M03L2D

Lab Sample ID: 240-48587-3

Date Collected: 03/24/15 08:23

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 17:27	VMN	TAL SAC

Client Sample ID: OC-M03L2F

Lab Sample ID: 240-48587-4

Date Collected: 03/24/15 08:39

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 18:05	VMN	TAL SAC

Client Sample ID: OC-M15L2C

Lab Sample ID: 240-48587-5

Date Collected: 03/24/15 09:27

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			173777	03/26/15 08:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174402	03/31/15 16:41	MRU	TAL CAN
Total/NA	Prep	3510C	RE		174965	04/03/15 07:48	CSC	TAL CAN
Total/NA	Analysis	8270D	RE	1	175181	04/06/15 13:41	MRU	TAL CAN
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 18:44	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 15:13	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376322	03/26/15 15:28	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 08:52	KLC	TAL CAN

Client Sample ID: OC-M15L2C

Lab Sample ID: 240-48587-5

Date Collected: 03/24/15 09:27

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:32	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:08	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M02L07

Lab Sample ID: 240-48587-6

Date Collected: 03/24/15 11:11

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			173777	03/26/15 08:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174402	03/31/15 17:07	MRU	TAL CAN
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 19:22	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 15:44	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:23	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:32	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:14	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M01L6C

Lab Sample ID: 240-48587-7

Date Collected: 03/24/15 10:50

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 20:00	VMN	TAL SAC

Client Sample ID: OC-M14L2B

Lab Sample ID: 240-48587-8

Date Collected: 03/24/15 10:28

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 20:38	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 15:59	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376449	03/27/15 12:26	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:27	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV

Client Sample ID: OC-M14L2B

Lab Sample ID: 240-48587-8

Date Collected: 03/24/15 10:28

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:16	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M24L65

Lab Sample ID: 240-48587-9

Date Collected: 03/24/15 13:12

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69743	03/30/15 11:03	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 21:16	VMN	TAL SAC
Total/NA	Analysis	300.0		2	376322	03/26/15 16:14	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376449	03/27/15 12:42	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:32	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:18	GRX	TAL SAV

Client Sample ID: OC-M24L72A

Lab Sample ID: 240-48587-10

Date Collected: 03/24/15 12:07

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 11:59	VMN	TAL SAC
Total/NA	Analysis	300.0		2	376322	03/26/15 16:30	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376449	03/27/15 12:57	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:36	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:19	GRX	TAL SAV

Client Sample ID: OC-M24L64

Lab Sample ID: 240-48587-11

Date Collected: 03/24/15 12:55

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			173777	03/26/15 08:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174402	03/31/15 17:32	MRU	TAL CAN
Total/NA	Prep	3510C	RE		174965	04/03/15 07:48	CSC	TAL CAN

Client Sample ID: OC-M24L64

Lab Sample ID: 240-48587-11

Date Collected: 03/24/15 12:55

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D	RE	1	175181	04/06/15 14:06	MRU	TAL CAN
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 12:37	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 16:45	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376322	03/26/15 17:01	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:40	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:20	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M24L116

Lab Sample ID: 240-48587-12

Date Collected: 03/24/15 12:36

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 13:16	VMN	TAL SAC

Client Sample ID: OC-M24L63

Lab Sample ID: 240-48587-13

Date Collected: 03/24/15 14:05

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			173777	03/26/15 08:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174402	03/31/15 17:58	MRU	TAL CAN
Total/NA	Prep	3510C	RE		174965	04/03/15 07:48	CSC	TAL CAN
Total/NA	Analysis	8270D	RE	1	175181	04/06/15 14:32	MRU	TAL CAN
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 13:54	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 18:18	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376322	03/26/15 18:33	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:44	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:21	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M24L66

Lab Sample ID: 240-48587-14

Date Collected: 03/24/15 13:50

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 17:59	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376322	03/26/15 18:48	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:48	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:22	GRX	TAL SAV

Client Sample ID: OC-M24L54

Lab Sample ID: 240-48587-15

Date Collected: 03/24/15 15:10

Matrix: Water

Date Received: 03/25/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			173777	03/26/15 08:57	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174402	03/31/15 18:23	MRU	TAL CAN
Total/NA	Prep	3510C	RE		174965	04/03/15 07:48	CSC	TAL CAN
Total/NA	Analysis	8270D	RE	1	175181	04/06/15 14:57	MRU	TAL CAN
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70463	04/07/15 18:37	VMN	TAL SAC
Total/NA	Analysis	300.0		2	376322	03/26/15 19:04	AJO	TAL SAV
Total Recoverable	Prep	3005A			173807	03/26/15 10:00	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174197	03/27/15 09:52	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			376250	03/26/15 11:41	JME	TAL SAV
Total/NA	Analysis	350.1		1	376284	03/26/15 15:41	JME	TAL SAV
Total/NA	Analysis	353.2		1	376380	03/25/15 18:24	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99797	03/25/15 08:45	PJL	TAL WFD

Client Sample ID: OC-M01L6D

Lab Sample ID: 240-48655-1

Date Collected: 03/25/15 12:11

Matrix: Water

Date Received: 03/26/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 23:11	VMN	TAL SAC

Client Sample ID: OC-M24L94

Lab Sample ID: 240-48655-2

Date Collected: 03/25/15 12:36

Matrix: Water

Date Received: 03/26/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			174423	03/31/15 08:42	JDR	TAL CAN
Total/NA	Analysis	8270D		1	174592	04/01/15 17:28	MRU	TAL CAN

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Client Sample ID: OC-M24L94
Date Collected: 03/25/15 12:36
Date Received: 03/26/15 10:30

Lab Sample ID: 240-48655-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RE		174965	04/03/15 07:48	CSC	TAL CAN
Total/NA	Analysis	8270D	RE	1	175181	04/06/15 15:22	MRU	TAL CAN
Total/NA	Prep	3510C			69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	70283	04/03/15 23:49	VMN	TAL SAC
Total/NA	Analysis	300.0		1	376499	03/28/15 10:59	AJO	TAL SAV
Total/NA	Analysis	300.0		4	376755	03/30/15 16:35	AJO	TAL SAV
Total Recoverable	Prep	3005A			174296	03/30/15 11:41	WAL	TAL CAN
Total Recoverable	Analysis	6010		1	174569	03/31/15 08:44	KLC	TAL CAN
Total/NA	Prep	Distill/Ammonia			377070	04/01/15 11:40	JME	TAL SAV
Total/NA	Analysis	350.1		1	377123	04/01/15 15:29	JME	TAL SAV
Total/NA	Analysis	353.2		2	376381	03/26/15 17:15	GRX	TAL SAV
Total/NA	Analysis	7196A		1	99796	03/26/15 11:16	RWE	TAL WFD

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-15 *
Connecticut	State Program	1	PH-0590	12-31-15
Florida	NELAP	4	E87225	06-30-15 *
Georgia	State Program	4	N/A	06-30-15 *
Illinois	NELAP	5	200004	07-31-15
Kansas	NELAP	7	E-10336	04-30-15 *
Kentucky (UST)	State Program	4	58	06-30-15 *
Kentucky (WW)	State Program	4	98016	12-31-15
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-15
Nevada	State Program	9	OH-000482008A	07-31-15
New Jersey	NELAP	2	OH001	06-30-15 *
New York	NELAP	2	10975	03-31-15 *
Ohio VAP	State Program	5	CL0024	10-31-15
Oregon	NELAP	10	4062	02-23-16
Pennsylvania	NELAP	3	68-00340	08-31-15
Texas	NELAP	6		08-31-15
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-15
Washington	State Program	10	C971	01-12-16
West Virginia DEP	State Program	3	210	12-31-15
Wisconsin	State Program	5	999518190	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-16
Alaska (UST)	State Program	10	UST-055	12-18-15
Arizona	State Program	9	AZ0708	08-11-15
Arkansas DEQ	State Program	6	88-0691	06-17-15
California	State Program	9	2897	01-31-16
Colorado	State Program	8	N/A	08-31-15
Connecticut	State Program	1	PH-0691	06-30-15
Florida	NELAP	4	E87570	06-30-15
Hawaii	State Program	9	N/A	01-29-16
Illinois	NELAP	5	200060	03-17-16
Kansas	NELAP	7	E-10375	10-31-15
Louisiana	NELAP	6	30612	06-30-15
Michigan	State Program	5	9947	01-31-16
Nevada	State Program	9	CA44	07-31-15
New Jersey	NELAP	2	CA005	06-30-15
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-16

* Certification renewal pending - certification considered valid.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Laboratory: TestAmerica Sacramento (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP Secondary AB	10	E87570	06-30-15
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-08-TX	05-31-15
US Fish & Wildlife	Federal		LE148388-0	02-28-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-16
Washington	State Program	10	C581	05-05-15
West Virginia (DW)	State Program	3	9930C	12-31-15
Wyoming	State Program	8	8TMS-Q	01-29-16

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-15
Arkansas DEQ	State Program	6	88-0692	01-31-16
California	State Program	9	2939	07-31-15
Colorado	State Program	8	N/A	12-31-15
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-15
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	N/A	06-30-15
Georgia	State Program	4	803	06-30-15
Guam	State Program	9	14-004r	04-16-15 *
Hawaii	State Program	9	N/A	06-30-15
Illinois	NELAP	5	200022	11-30-15
Indiana	State Program	5	N/A	06-30-15
Iowa	State Program	7	353	07-01-15
Kentucky (DW)	State Program	4	90084	12-31-15
Kentucky (UST)	State Program	4	18	06-30-15
Kentucky (WW)	State Program	4	90084	12-31-15
Louisiana	NELAP	6	30690	06-30-15
Louisiana (DW)	NELAP	6	LA150014	12-31-15
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-15
Massachusetts	State Program	1	M-GA006	06-30-15
Michigan	State Program	5	9925	06-30-15
Mississippi	State Program	4	N/A	06-30-15
Montana	State Program	8	CERT0081	12-31-15
Nebraska	State Program	7	TestAmerica-Savannah	06-30-15
New Jersey	NELAP	2	GA769	06-30-15
New Mexico	State Program	6	N/A	06-30-15
New York	NELAP	2	10842	03-31-16
North Carolina (DW)	State Program	4	13701	07-31-15
North Carolina (WW/SW)	State Program	4	269	12-31-15
Oklahoma	State Program	6	9984	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Laboratory: TestAmerica Savannah (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Pennsylvania	NELAP	3	68-00474	06-30-15
Puerto Rico	State Program	2	GA00006	12-31-15
South Carolina	State Program	4	98001	06-30-15
Tennessee	State Program	4	TN02961	06-30-15
Texas	NELAP	6	T104704185-14-7	11-30-15
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-15
Washington	State Program	10	C805	06-10-15
West Virginia (DW)	State Program	3	9950C	12-31-15
West Virginia DEP	State Program	3	094	06-30-15
Wisconsin	State Program	5	999819810	08-31-15
Wyoming	State Program	8	8TMS-L	06-30-15

Laboratory: TestAmerica Westfield

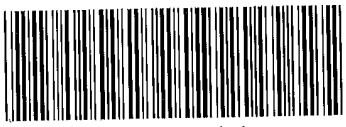
All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0494	09-30-16
Massachusetts	State Program	1	M-MA014	06-30-15
New Hampshire	NELAP	1	2539	08-08-15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS


240-48587 Chain of Custody

TestAmerica Westfield
501 Southampton Road
Westfield MA 01085
Phone: (413) 572-4000 Fax: (303) 467-7247

Boston Service Center
240 Bear Hill Road -- Suite 104
Waltham MA 02451
Phone: (781) 466-6900 Fax: (781) 466-6901

3 le 14.1

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information:	Sample Collector's Name (Please Print Neatly): Chris Mazzolini	Lab PM: Becky Mason	Lab COC Barcode Label	COC No:
Client Contact: James Cashwell	Sample Collector's Phone: 339 927 3796	E-Mail: Becky.Mason@testamericainc.com		Page: 1 of 2
Company: AMEC Foster Wheeler		Analysis Requested		Job #:
Address: PO Box 248	Due Date Requested: Standard			Preservation Codes: A - Hydrochloric Acid; B - Sodium Hydroxide; C - Zinc Acetate; D - Nitric Acid; E - Sodium Bisulfite; F - Methanol; H - Ascorbic Acid; J - Deionized Water; M - Hexane; N - No Preservative; P - Sodium Sulfate; Q - Sodium Sulfite; R - Sodium Thiosulfate; S - Sulfuric Acid; Z - other (specify)
City: Charleston	Turnaround Time (TAT) Requested (business days): Standard			
State and Zip: TN 37310				Regulatory Programs: MCP ■; RCP ☐; DEP Form ☐; eDEP Filing ☐; GW1/S1 ☐; CT RSR ☐; EDD Required ■; NPDES ☐
Client's Phone: 423 336-4012	Quote # or Project #: 48007217			
Client's Contact Email: jmcashwell@olin.com	PO #:			
Client's Project Name/Number: Olin Wilmington Residential Well	WO #:			SUBCONTRACT POLICY: Unless you provide instructions to the contrary, or specify which sub-contract labs are or are not to be used, you agree in advance to permit TestAmerica to use certified, subcontract labs, without any additional notification made by us, as necessary to fulfill your work order.
Sample Collection Site Name & Location:	PWS ID #:			

Sample Identification	Sample Collection Date (MM/DD/YY)	Sample Collection Time (24 Hour Clock)	Sample Type: C=Comp G=Grab	Matrix Type **	SVOC 8270 client list	Metals 6010 Cr/Na	Hex Cr by Method 7196A or Method 7199 Circle one	NO2 and NO3 /300.28 (Cl & SO4)	Ammonia 350.1	NDMA/NDPA Modified 521										Total Number of Containers (enter total for each line)	Special Instructions & Notes:
			Preservation Codes: =>		N	D	N	N	S	N										↓	
OC-M03L07	03/24/15	0901	G	DW						2										2	
OC-M03L02	03/24/15	0804	G	DW						2										2	
OC-M03L2D	03/24/15	0823	G	DW						2										2	
OC-M03L2F	03/24/15	0839	G	DW						2										2	
OC-M15L2C	03/24/15	0927	G	DW	2	1	1	1	1	2										8	
OC-M02L07	03/24/15	1111	G	DW	2	1	1	1	1	2										8	
OC-M01L65	03/24/15	1050	G	DW						2										2	
OC-M14L2B	03/24/15	1028	G	DW		1	1	1	1	2										6	
OC-M24L65	03/24/15	1312	G	DW		1		1	1	2										5	
OC-M24L72A	03/24/15	1207	G	DW		1		1	1	2										5	

Possible Hazard Identification (please check off each that may apply): ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal Requirements (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

** **Matrix Types:** A=Air S=Solid/Soil W=Water O=Oil X=Waste (non-water) Z=Other: _____

► **NOTE!! ALL SAMPLES MUST BE TRANSPORTED IN A COOLER, ON ICE !!** ◄

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3/24/15 1535			3/24/15 1535	TA
	3/24/15 16:00	TA		3/25/15 1000	TA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Westfield
501 Southampton Road
Westfield MA 01085
Phone: (413) 572-4000 Fax: (303) 467-7247

Boston Service Center 3.6 (C4.)
240 Bear Hill Road -- Suite 104
Waltham MA 02451
Phone: (781) 466-6900 Fax: (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information:

Client Contact: James Cashwell
Company: AMEC Foster Wheeler
Address: PO Box 248
City: Charleston
State and Zip: TN 37310
Client's Phone: 423 336-4012
Client's Contact Email: jmcashwell@olin.com
Client's Project Name/Number: Olin Wilmington Residential Well
Sample Collection Site Name & Location:

Sample Collector's Name (Please Print Neatly): Chris Mazzolini
Sample Collector's Phone: 339-927-3796
Due Date Requested: Standard
Turnaround Time (TAT) Requested (business days): Standard
Quote # or Project #: 48007217
PO #:
WO #:
PWS ID #:

Lab PM: Becky Mason
E-Mail: Becky.Mason@testamericainc.com
Lab COC Barcode Label
COC No:
Page: 2 of 2
Job #:

Analysis Requested

Sample Identification	Sample Collection Date (MM/DD/YY)	Sample Collection Time (24 Hour Clock)	Sample Type: C=Comp G=Grab	Matrix Type **	SVOC 8270 client list	Metals 6010 Cr/Na	Hex Cr by Method 7196A or Method 7199 Circle one	NO2 and NO3 /300.28 (Cl & SO4)	Ammonia 350.1	NDMA/NDPA Modified 521	Total Number of Containers (enter total for each line)	Special Instructions & Notes:
			Preservation Codes =>		N	D	N	N	S	N	↓	
OC-M24L64	03/24/15	1255	G	DW	2	1	1	1	1	2	8	
OC-M24L116	03/24/15	1236	G	DW						2	2	
OC-M24L63	03/24/15	1405	G	DW	2	1	1	1	1	2	8	
OC-M24L66	03/24/15	1350	G	DW		1		1	1	2	5	
OC-M24L54	03/24/15	1510	G	DW	2	1	1	1	1	2	8	

Preservation Codes:
A - Hydrochloric Acid
B - Sodium Hydroxide
C - Zinc Acetate
D - Nitric Acid
E - Sodium Bisulfite
F - Methanol
H - Ascorbic Acid
J - Deionized Water
M - Hexane
N - No Preservative
P - Sodium Sulfate
Q - Sodium Sulfite
R - Sodium Thiosulfate
S - Sulfuric Acid
Z - other (specify)

Regulatory Programs:
MCP ■ GW1/S1 ☐
RCP ☐ CT RSR ☐
DEP Form ☐ EDD Required ■
eDEP Filing ☐ NPDES ☐

SUBCONTRACT POLICY: Unless you provide instructions to the contrary, or specify which sub-contract labs are or are not to be used, you agree in advance to permit TestAmerica to use certified, subcontract labs, without any additional notification made by us, as necessary to fulfill your work order.

Possible Hazard Identification (please check off each that may apply):
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal Requirements (A fee may be assessed if samples are retained longer than 1 month):
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

** **Matrix Types:** A=Air S=Solid/Soil W=Water O=Oil X=Waste (non-water) Z=Other: _____

► **NOTE!! ALL SAMPLES MUST BE TRANSPORTED IN A COOLER, ON ICE !!** ◄

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3/24/15 1535		[signature]	3/24/15 15:35	TA
[signature]	3/24/15 16:00	TA	[signature]	3/25/15 1000	TA

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

WI-QA-010 rev 8
Revised 10/29/2014

TestAmerica Canton Sample Receipt Form/Narrative Login # : 48587
Canton Facility

Client AMEC Foster Wheeler Site Name 91in

Cooler Received on 3/25/15 Opened on 3/25/15

Cooler unpacked by: Heather Rowe

FedEx: 1st Grd (Exp) UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # ~~TA not~~ Foam Box (Client Cooler) Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt

~~IR GUN# A (CF +4.0 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C~~

IR GUN# 4 (CF +0.5 °C) Observed Cooler Temp. 3.6 °C Corrected Cooler Temp. 4.1 °C ☐ See Multiple Cooler Form

~~IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C~~

IR GUN# 8 (CF -1.2 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity (1) (Yes) No
   -Were custody seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were custody seals on the bottle(s)? Yes (No)
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the sampler(s) clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels be reconciled with the COC? (Yes) No
9. Were correct bottle(s) used for the test(s) indicated? (Yes) No
10. Sufficient quantity received to perform indicated analyses? (Yes) No
11. Were sample(s) at the correct pH upon receipt? (Yes) No NA pH Strip Lot# HC425511
12. Were VOAs on the COC? Yes (No)
13. Were air bubbles >6 mm in any VOA vials? Yes No (NA)
14. Was a trip blank present in the cooler(s)? Trip Blank Lot # Yes (No)

Contacted PM Date by via Verbal Voice Mail Other

Concerning

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

15. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

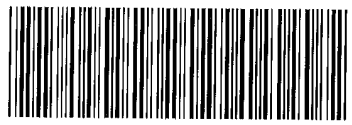
Time preserved: Preservative(s) added/Lot number(s):

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS



240-48655 Chain of Custody

3.81 C4.3

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Westfield
501 Southampton Road
Westfield MA 01085
Phone: (413) 572-4000 Fax: (303) 467-7247

Boston Service Center
240 Bear Hill Road -- Suite 104
Waltham MA 02451
Phone: (781) 466-6900 Fax: (781) 466-6901

Client Information:	Sample Collector's Name (Please Print Neatly): Chris Mazzolini	Lab PM: Becky Mason	Lab COC Barcode Label	COC No:
Client Contact: James Cashwell	Sample Collector's Phone: 339 927 3796	E-Mail: Becky.Mason@testamericainc.com		Page: 1 of 1
Company: AMEC Foster Wheeler				Job #:
Address: PO Box 248	Due Date Requested: Standard			
City: Charleston	Turnaround Time (TAT) Requested (business days): Standard			
State and Zip: TN 37310				
Client's Phone: 423 336-4012	Quote # or Project #: 48007217			
Client's Contact Email: jmcashwell@olin.com	PO #:			
Client's Project Name/Number: Olin Wilmington Residential Well	WO #:			
Sample Collection Site Name & Location:	PWS ID #:			

Analysis Requested

Preservation Codes:
A - Hydrochloric Acid; B - Sodium Hydroxide; C - Zinc Acetate; D - Nitric Acid; E - Sodium Bisulfite; F - Methanol; H - Ascorbic Acid; J - Deionized Water; M - Hexane; N - No Preservative; P - Sodium Sulfate; Q - Sodium Sulfite; R - Sodium Thiosulfate; S - Sulfuric Acid; Z - other (specify)

Regulatory Programs:
MCP ■ GW1/S1 ☐
RCP ☐ CT RSR ☐
DEP Form ☐ EDD Required ■
eDEP Filing ☐ NPDES ☐

SUBCONTRACT POLICY: Unless you provide instructions to the contrary, or specify which sub-contract labs are or are not to be used, you agree in advance to permit TestAmerica to use certified, subcontract labs, without any additional notification made by us, as necessary to fulfill your work order.

Sample Identification	Sample Collection Date (MM/DD/YY)	Sample Collection Time (24 Hour Clock)	Sample Type: C=Comp G=Grab	Matrix Type **	SVOC 8270 client list	Metals 6010 Cr/Na	Hex Cr by Method 7196A or Method 7199 Circle one	NO2 and NO3 /300.28 (Cl & SO4)	Ammonia 350.1	NDMA/NDPA Modified 521	Total Number of Containers (enter total for each line)	Special Instructions & Notes:
			Preservation Codes =>		N	D	N	N	S	N		
OC-M01L6D	03/25/15	1211	G	DW						2	2	
OC-M24L94	03/25/15	1236	G	DW	2	1	1	1	1	2	8	

Possible Hazard Identification (please check off each that may apply):
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal Requirements (A fee may be assessed if samples are retained longer than 1 month):
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

** **Matrix Types:** A=Air S=Solid/Soil W=Water O=Oil X=Waste (non-water) Z=Other: _____

► **NOTE!! ALL SAMPLES MUST BE TRANSPORTED IN A COOLER, ON ICE !!** ◄

	Date/Time:	Company		Date/Time:	Company
Relinquished by:	3/25/15 1415	Amec	Received by:	3/25/15 14:15	TA
Relinquished by:	3/25/15 16:00	TA	Received by:	3/26/15 10:30	TA/Canton
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 48655**
Canton Facility

Client AMEC Site Name _____ Cooler unpacked by:

Cooler Received on 3/26/15 Opened on 3/26/15

FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt

~~IR GUN# A (CF +4.0 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C~~

IR GUN# 4 (CF +0.5 °C) Observed Cooler Temp. 3.8 °C Corrected Cooler Temp. 4.3 °C ☐ See Multiple Cooler Form

~~IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C~~

IR GUN# 8 (CF -1.2 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the sampler(s) clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC425511**
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? Yes No NA
14. Was a trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
X:\Document Control\SOPs\Work Instructions\Word Version Work Instructions\WI-NC-099P-020915 Cooler Receipt Form.doc djl

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48587
List Number: 4
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento
List Creation: 03/25/15 12:40 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48587
List Number: 5
Creator: Banda, Christy S

List Source: TestAmerica Savannah
List Creation: 03/25/15 03:49 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48587
List Number: 3
Creator: Lisowski, Peter J

List Source: TestAmerica Westfield
List Creation: 03/25/15 03:38 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48655

List Source: TestAmerica Canton

List Number: 2

Creator: Maddux, Ann

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48655
List Number: 4
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento
List Creation: 03/26/15 02:21 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48655
List Number: 3
Creator: Banda, Christy S

List Source: TestAmerica Savannah
List Creation: 03/26/15 03:33 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 240-48587-1

Login Number: 48655
List Number: 5
Creator: Emerich, Rich W

List Source: TestAmerica Westfield
List Creation: 03/27/15 08:31 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Isotope Dilution Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 240-48587-1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	NDMA (25-150)	NDNP (25-150)						
240-48587-1	OC-M03L07	36	89						
240-48587-2	OC-M03L02	39	95						
240-48587-3	OC-M03L2D	40	98						
240-48587-4	OC-M03L2F	35	78						
240-48587-5	OC-M15L2C	38	84						
240-48587-6	OC-M02L07	36	73						
240-48587-7	OC-M01L6C	39	89						
240-48587-8	OC-M14L2B	35	86						
240-48587-9	OC-M24L65	39	71						
240-48587-10	OC-M24L72A	48	108						
240-48587-11	OC-M24L64	39	104						
240-48587-12	OC-M24L116	44	121						
240-48587-13	OC-M24L63	41	110						
240-48587-14	OC-M24L66	40	95						
240-48587-15	OC-M24L54	42	106						
240-48655-1	OC-M01L6D	40	86						
240-48655-2	OC-M24L94	38	89						
LCS 320-69743/2-A	Lab Control Sample	42	93						
LCS 320-69880/2-A	Lab Control Sample	42	91						
MB 320-69743/1-A	Method Blank	41	79						
MB 320-69880/1-A	Method Blank	41	96						

Surrogate Legend

NDMA = N-Nitrosodimethylamine-d6

NDNP = N-Nitrosodi-n-propylamine-d14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-12292-1
Client Project/Site: Olin Wilmington Residential Well

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
4/10/2015 10:11:13 AM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-12292-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-12292-1

Receipt
The sample was received on 3/27/2015 9:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS Semi VOA
Method(s) GCMSMS_NDMA: Due to the level of spike added to the laboratory control sample (LCS) (prep batches 69743 and 69880, analytical batch 70283), analyte NDPA had recoveries above the calibration range. No action was taken, since all recoveries (analyte and surrogate) were within the control limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 69880 for method NDMA-aqueous.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Client Sample ID: OC-M04L5C **Lab Sample ID: 320-12292-1**

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Client Sample ID: OC-M04L5C
Date Collected: 03/26/15 08:05
Date Received: 03/27/15 09:50

Lab Sample ID: 320-12292-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		03/31/15 11:25	04/04/15 00:27	1
N-Nitrosodimethylamine	ND		1.9	0.37	ng/L		03/31/15 11:25	04/04/15 00:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*38*		*25 - 150*	*03/31/15 11:25*	*04/04/15 00:27*	*1*
N-Nitrosodi-n-propylamine-d14	*86*		*25 - 150*	*03/31/15 11:25*	*04/04/15 00:27*	*1*

Isotope Dilution Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)									
		NDMA	NDNP								
Lab Sample ID	Client Sample ID	(25-150)	(25-150)								
320-12292-1	OC-M04L5C	38	86								
LCS 320-69880/2-A	Lab Control Sample	42	91								
MB 320-69880/1-A	Method Blank	41	96								

Surrogate Legend

NDMA = N-Nitrosodimethylamine-d6

NDNP = N-Nitrosodi-n-propylamine-d14

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Lab Sample ID: MB 320-69880/1-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 69880

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		03/31/15 11:25	04/03/15 21:54	1
N-Nitrosodimethylamine	ND		2.0	0.39	ng/L		03/31/15 11:25	04/03/15 21:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*41*		*25 - 150*	*03/31/15 11:25*	*04/03/15 21:54*	*1*
N-Nitrosodi-n-propylamine-d14	*96*		*25 - 150*	*03/31/15 11:25*	*04/03/15 21:54*	*1*

Lab Sample ID: LCS 320-69880/2-A
Matrix: Water
Analysis Batch: 70283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 69880

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodi-n-propylamine	20.0	23.2	E	ng/L		116	53 - 166
N-Nitrosodimethylamine	20.0	20.7		ng/L		104	58 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
N-Nitrosodimethylamine-d6	*42*		*25 - 150*
N-Nitrosodi-n-propylamine-d14	*91*		*25 - 150*

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

GC/MS Semi VOA

Prep Batch: 69880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-12292-1	OC-M04L5C	Total/NA	Water	3510C	
LCS 320-69880/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-69880/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 70283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-12292-1	OC-M04L5C	Total/NA	Water	GCMSMS_NDMA	69880
LCS 320-69880/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	69880
MB 320-69880/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	69880

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Client Sample ID: OC-M04L5C
Date Collected: 03/26/15 08:05
Date Received: 03/27/15 09:50

Lab Sample ID: 320-12292-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1057.3 mL	0.5 mL	69880	03/31/15 11:25	STL	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	1057.3 mL	0.5 mL	70283	04/04/15 00:27	VMN	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-16
Alaska (UST)	State Program	10	UST-055	12-18-15
Arizona	State Program	9	AZ0708	08-11-15
Arkansas DEQ	State Program	6	88-0691	06-17-15
California	State Program	9	2897	01-31-16
Colorado	State Program	8	N/A	08-31-15
Connecticut	State Program	1	PH-0691	06-30-15
Florida	NELAP	4	E87570	06-30-15
Hawaii	State Program	9	N/A	01-29-16
Illinois	NELAP	5	200060	03-17-16
Kansas	NELAP	7	E-10375	10-31-15
Louisiana	NELAP	6	30612	06-30-15
Michigan	State Program	5	9947	01-31-16
Nevada	State Program	9	CA44	07-31-15
New Jersey	NELAP	2	CA005	06-30-15
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-16
Oregon	NELAP Secondary AB	10	E87570	06-30-15
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-08-TX	05-31-15
US Fish & Wildlife	Federal		LE148388-0	02-28-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-16
Washington	State Program	10	C581	05-05-15
West Virginia (DW)	State Program	3	9930C	12-31-15
Wyoming	State Program	8	8TMS-Q	01-29-16

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Method Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Method	Method Description	Protocol	Laboratory
GCMSMS_NDMA	Nitrosamines by Isotope Dilution and GC/CI/MS/MS	TestAmerica SOP	TAL SAC

Protocol References:

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12292-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-12292-1	OC-M04L5C	Water	03/26/15 08:05	03/27/15 09:50

TestAmerica Westfield
501 Southampton Road
Westfield MA 01085
Phone: (413) 572-4000 Fax: (303) 467-7247

Boston Service Center
240 Bear Hill Road -- Suite 104
Waltham MA 02451
Phone: (781) 466-6900 Fax: (781) 466-6901

Chain of Custody Record

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Client Information:
Client Contact: James Cashwell
Company: AMEC Foster Wheeler
Address: PO Box 248
City: Charleston
State and Zip: TN 37310
Client's Phone: 423 336-4012
Client's Contact Email: jmcashwell@olin.com
Client's Project Name/Number: Olin Wilmington Residential Well
Sample Collection Site Name & Location

Sample Collector's Name (Please Print Neatly): Chris Mazzolini
Sample Collector's Phone: 339 927 3796
Due Date Requested: Standard
Turnaround Time (TAT) Requested (business days): Standard
Quote # or Project #: 48007217
PO #:
WO #:
PWS ID #

Lab PM: Becky Mason
E-Mail: Becky.Mason@testamericainc.com
Lab COC Barcode Label

COC No:
Page: 1 of 1
Job #

Analysis Requested

Sample Identification	Sample Collection Date (MM/DD/YY)	Sample Collection Time (24 Hour Clock)	Sample Type: C=Comp G=Grab	Matrix Type **	SVOC 8270 client list	Metals 6010 Cr/Na	Hex Cr by Method 7196A or Method 7199 Circle one	NO2 and NO3 /300.28 (Cl & SO4)	Ammonia 350.1	NDMA/NDPA Modified 521	Total Number of Containers (enter total for each line)
			Preservation Codes =>		N	D	N	N	S	N	
OC-MW4LSC	03/26/15	0805	G	DW						2	2

Special Instructions & Notes:

320-12292 Chain of Custody

Preservation Codes:
A - Hydrochloric Acid
B - Sodium Hydroxide
C - Zinc Acetate
D - Nitric Acid
E - Sodium Bisulfite
F - Methanol
H - Ascorbic Acid
J - Deionized Water
M - Hexane
N - No Preservative
P - Sodium Sulfate
Q - Sodium Sulfite
R - Sodium Thiosulfate
S - Sulfuric Acid
Z - other (specify)

Regulatory Programs:
MCP ■ GW1/S1 ☐
RCP ☐ CT RSR ☐
DEP Form ☐ EDD Required ■
eDEP Filing ☐ NPDES ☐

SUBCONTRACT POLICY: Unless you provide instructions to the contrary, or specify which sub-contract labs are or are not to be used, you agree in advance to permit TestAmerica to use certified, subcontract labs, without any additional notification made by us, as necessary to fulfill your work order.

Possible Hazard Identification (please check off each that may apply):
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal Requirements (A fee may be assessed if samples are retained longer than 1 month):
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

** **Matrix Types:** A=Air S=Solid/Soil W=Water O=Oil X=Waste (non-water) Z=Other: _____

▶ NOTE!! ALL SAMPLES MUST BE TRANSPORTED IN A COOLER, ON ICE !! ◀

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		3/26/15	AMEC		3-26-15 1140	TA
2		3-26-15			3/27/15 950	TA
3						

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.: Seals
Cooler Temperature(s) °C and Other Remarks: 1.4°C

WI-QA-010 rev 8
Revised 10/29/2014

Page 14 of 15

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 320-12292-1

Login Number: 12292

List Source: TestAmerica Sacramento

List Number: 1

Creator: Hytrek, Cheryl

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	N/A	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

3855 North Ocoee Street Suite 200, Cleveland, TN 37312
(423) 336-4000 FAX (423) 336-4166

To: James Cashwell
From: Randy Morris
Date: May 4, 2015
Subject: Olin Chemical Superfund Site – April 2015 Residential Well Resample

DATA VALIDATION SUMMARY
APRIL 2015 RESIDENTIAL WELL RESAMPLE OF WELL OC-M03L02
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Data Set 320-12603-1

1.0 INTRODUCTION

Data validation was completed for the resample of residential well OC-M03L02 collected on April 16, 2015. The sample summary is found in Table 1. The sample was analyzed by TestAmerica Laboratories (TAL) located in West Sacramento, California and reported in sample delivery group (SDG) 320-12603-1. The sample was analyzed for:

- N-Nitrosodimethylamine (NDMA) and n-nitrosodi-n-propylamine (NDPrA) by USEPA modified Method 521 (Lab method: WS-MS-0012)

Sample results and lab data were validated in accordance with the Final Project Operations Plan Volume III-B Quality Assurance Project Plan (QAPP) [MACTEC, 2009]. A chemist review was completed on the NDMA/NDPrA data as described in the QAPP.

A complete summary of final sample results is included in Table 2. Results are interpreted to be usable as reported by the laboratory.

2.0 NDMA and NDPrA

N-Nitrosodimethylamine (NDMA) analysis was completed using a modified USEPA Method 521 procedure, which provides very low detection limits at an analytical reporting limit of two nanograms per liter (ng/L) for NDMA and NDPrA. NDMA samples are collected in amber-glass bottles and preserved at 4 degrees Celsius prior to analysis.

QC evaluations were based on project specific method performance objectives described in the QAPP [MACTEC, 2009], the TAL Standard Operating Procedure (SOP) WS-MS-0012 for NDMA/NDPrA analysis, and professional judgment of the project chemist. The analytical package

was reviewed using a data quality evaluation checklist that was developed specifically for the Olin Chemical Superfund Site. Validation included a full review of all documentation and data associated with sample collection, shipment, and analysis. The following items were reviewed:

* Data Package Narrative, Completeness, and Chain of Custody (COC) Records
* Sample Collection, Preservation, and Holding Times
* Instrument Calibration
* QC Blanks
* Laboratory Control Sample (LCS)
* Internal Standard Recovery
* Reporting Limit Review
* Raw Data Checks and Calculations Verification
* Electronic Data Verification

* = Indicates that all criteria were met for this quality control parameter

The results are interpreted to be usable as reported by TestAmerica.

Randy J. Morris

Randy Morris
Environmental Specialist, Data Quality

May 4, 2015
Date

REFERENCES:

MACTEC Engineering and Consulting, Inc. (MACTEC), 2009. "Final Project Operation Plan Volume IIB Quality Assurance Project Plan"; Olin Chemical Superfund Site; 51 Eames Street; Wilmington, Massachusetts; August 2009.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines for Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.

Table 1
Sample Summary
Data Validation Report
April 2015 Residential Well Resample
Olin Chemical Superfund Site
Wilmington, Massachusetts

						Method Class	NDMA/NDPA
						Analysis Method	TANDMA
						Fraction	N
SDG	**Matrix**	**Media**	**Location**	**Field Sample Date**	**Field Sample ID**	**Qc Code**	
320-12603-1	L	GW	M-03/L-02	4/16/2015	OC-M03L02	FS	2

Notes:
Number listed under method indicates number of target analytes reported.

Prepared by / Date: WPC 5/4/2015
Checked by / Date: RTM 5/4/2015

Table 2
Final Results Summary
Data Validation Report
April 2015 Residential Well Resample
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Lab Sample Delivery Group	320-12603-1	
			Location	M-03/L-02	
			Field Sample Date	4/16/2015	
			Field Sample ID	OC-M03L02	
			Qc Code	FS	
Method	**Fraction**	**Parameter**	**Units**	Result	Qualifier
TANDMA	N	N-Nitrosodi-n-propylamine	NG/L	1.9	U
TANDMA	N	N-Nitrosodimethylamine	NG/L	0.73	J

Notes:
FS = field sample
U = not detected, value is the reporting limit
J = value is estimated
ng/l = nanogram per liter

Prepared by / Date: WPC 5/4/2015
Checked by / Date: RTM 5/4/2015

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-12603-1
Client Project/Site: Olin Wilmington Residential Well

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
4/30/2015 8:53:04 AM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-12603-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-12603-1

Receipt
The sample was received on 4/17/2015 9:25 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 71580 for method NDMA-aqueous.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Client Sample ID: OC-M03L02

Lab Sample ID: 320-12603-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
N-Nitrosodimethylamine	0.73	J	1.9	0.37	ng/L	1		GCMSMS_NDMA	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Client Sample ID: OC-M03L02
Date Collected: 04/16/15 08:24
Date Received: 04/17/15 09:45

Lab Sample ID: 320-12603-1
Matrix: Water

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		1.9	0.44	ng/L		04/20/15 11:45	04/27/15 21:28	1
N-Nitrosodimethylamine	**0.73**	**J**	1.9	0.37	ng/L		04/20/15 11:45	04/27/15 21:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*46*		*25 - 150*	*04/20/15 11:45*	*04/27/15 21:28*	*1*
N-Nitrosodi-n-propylamine-d14	*85*		*25 - 150*	*04/20/15 11:45*	*04/27/15 21:28*	*1*

Isotope Dilution Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	NDMA (25-150)	NDNP (25-150)								
320-12603-1	OC-M03L02	46	85								
LCS 320-71580/2-A	Lab Control Sample	50	90								
MB 320-71580/1-A	Method Blank	49	107								

Surrogate Legend

NDMA = N-Nitrosodimethylamine-d6

NDNP = N-Nitrosodi-n-propylamine-d14

Method: GCMSMS_NDMA - Nitrosamines by Isotope Dilution and GC/CI/MS/MS

Lab Sample ID: MB 320-71580/1-A
Matrix: Water
Analysis Batch: 72228

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 71580

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodi-n-propylamine	ND		2.0	0.47	ng/L		04/20/15 11:45	04/27/15 20:12	1
N-Nitrosodimethylamine	ND		2.0	0.39	ng/L		04/20/15 11:45	04/27/15 20:12	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
N-Nitrosodimethylamine-d6	*49*		*25 - 150*	*04/20/15 11:45*	*04/27/15 20:12*	*1*
N-Nitrosodi-n-propylamine-d14	*107*		*25 - 150*	*04/20/15 11:45*	*04/27/15 20:12*	*1*

Lab Sample ID: LCS 320-71580/2-A
Matrix: Water
Analysis Batch: 72228

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 71580

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
N-Nitrosodi-n-propylamine	20.0	23.8		ng/L		119	53 - 166
N-Nitrosodimethylamine	20.0	21.6		ng/L		108	58 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
N-Nitrosodimethylamine-d6	*50*		*25 - 150*
N-Nitrosodi-n-propylamine-d14	*90*		*25 - 150*

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

GC/MS Semi VOA

Prep Batch: 71580

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-12603-1	OC-M03L02	Total/NA	Water	3510C	
LCS 320-71580/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 320-71580/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 72228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-12603-1	OC-M03L02	Total/NA	Water	GCMSMS_NDMA	71580
LCS 320-71580/2-A	Lab Control Sample	Total/NA	Water	GCMSMS_NDMA	71580
MB 320-71580/1-A	Method Blank	Total/NA	Water	GCMSMS_NDMA	71580

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Client Sample ID: OC-M03L02
Date Collected: 04/16/15 08:24
Date Received: 04/17/15 09:45

Lab Sample ID: 320-12603-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1057.8 mL	0.5 mL	71580	04/20/15 11:45	NGK	TAL SAC
Total/NA	Analysis	GCMSMS_NDMA		1	1057.8 mL	0.5 mL	72228	04/27/15 21:28	VMN	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Laboratory: TestAmerica Sacramento

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-16
Alaska (UST)	State Program	10	UST-055	12-18-15
Arizona	State Program	9	AZ0708	08-11-15
Arkansas DEQ	State Program	6	88-0691	06-17-15
California	State Program	9	2897	01-31-16
Colorado	State Program	8	N/A	08-31-15
Connecticut	State Program	1	PH-0691	06-30-15
Florida	NELAP	4	E87570	06-30-15
Hawaii	State Program	9	N/A	01-29-16
Illinois	NELAP	5	200060	03-17-16
Kansas	NELAP	7	E-10375	10-31-15
Louisiana	NELAP	6	30612	06-30-15
Michigan	State Program	5	9947	01-31-16
Nevada	State Program	9	CA44	07-31-15
New Jersey	NELAP	2	CA005	06-30-15
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-16
Oregon	NELAP Secondary AB	10	E87570	06-30-15
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-08-TX	05-31-15
US Fish & Wildlife	Federal		LE148388-0	02-28-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-16
Washington	State Program	10	C581	05-05-15
West Virginia (DW)	State Program	3	9930C	12-31-15
Wyoming	State Program	8	8TMS-Q	01-29-16

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Method Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Method	Method Description	Protocol	Laboratory
GCMSMS_NDMA	Nitrosamines by Isotope Dilution and GC/CI/MS/MS	TestAmerica SOP	TAL SAC

Protocol References:

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Wilmington Residential Well

TestAmerica Job ID: 320-12603-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-12603-1	OC-M03L02	Water	04/16/15 08:24	04/17/15 09:45

TestAmerica Westfield
501 Southampton Road
Westfield MA 01085
Phone: (413) 572-4000 Fax: (303) 467-7247

Boston Service Center
240 Bear Hill Road -- Suite 104
Waltham MA 02451
Phone: (781) 466-6900 Fax: (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information:
Client Contact: James Cashwell
Company: AMEC Foster Wheeler
Address: PO Box 248
City: Charleston
State and Zip: TN 37310
Client's Phone: 423 336-4012
Client's Contact Email: jmcashwell@olin.com
Client's Project Name/Number: Olin Wilmington Residential Well
Sample Collection Site Name & Location:

Sample Collector's Name (Please Print Neatly): Chris Mazzolini
Sample Collector's Phone: 339 927 3796
Due Date Requested: 2 week ~~Standard~~ ASAP
Turnaround Time (TAT) Requested (business days): 2week ~~Standard~~ ASAP
Quote # or Project #: 48007217
PO #:
WO #:
PWS ID #:

Lab PM: Becky Mason
E-Mail: Becky.Mason@testamericainc.com
Lab COC Barcode Label

COC No.
Page: 1 of 1
Job #:

Analysis Requested

Sample Identification	Sample Collection Date (MM/DD/YY)	Sample Collection Time (24 Hour Clock)	Sample Type: C=Comp G=Grab	Matrix Type **	SVOC 8270 client list	Metals 6010 Cr/Na	Hex Cr by Method 7196A or Method 7199 Circle one	NO2 and NO3 /300.28 (Cl & SO4)	Ammonia 350.1	NDMA/NDPA Modified 521	Total Number of Containers (enter total for each line)
			Preservation Codes =>		N	D	N	N	S	N	
OC-MO3LO2	04/16/15	0824	G	DW						2	2

Preservation Codes:
A - Hydrochloric Acid; B - Sodium Hydroxide; C - Zinc Acetate; D - Nitric Acid; E - Sodium Bisulfite; F - Methanol; H - Ascorbic Acid; J - Deionized Water; M - Hexane; N - No Preservative; P - Sodium Sulfate; Q - Sodium Sulfite; R - Sodium Thiosulfate; S - Sulfuric Acid; Z - other (specify)

Regulatory Programs:
MCP ■ GW1/S1 ☐
RCP ☐ CT RSR ☐
DEP Form ☐ EDD Required ■
eDEP Filing ☐ NPDES ☐

SUBCONTRACT POLICY Unless you provide instructions to the contrary, or specify which sub-contract labs are or are not to be used, you agree in advance to permit TestAmerica to use certified, subcontract labs, without any additional notification made by us, as necessary to fulfill your work order.

Special Instructions & Notes:

320-12603 Chain of Custody

Possible Hazard Identification (please check off each that may apply):
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal Requirements (A fee may be assessed if samples are retained longer than 1 month):
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

** **Matrix Types:** A=Air S=Solid/Soil W=Water O=Oil X=Waste (non-water) Z=Other: _____

► **NOTE!! ALL SAMPLES MUST BE TRANSPORTED IN A COOLER, ON ICE !!** ◄

	Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company
1		4/16/15 1203	Amec Foster Wheeler		4/16/15 1203	TA
2		4-16-15 1700	TA		4/17/15 945	TA
3						

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.: Seals
Cooler Temperature(s) °C and Other Remarks: -0.2°C

WI-QA-010 rev 8
Revised 10/29/2014

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Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 320-12603-1

Login Number: 12603

List Source: TestAmerica Sacramento

List Number: 2

Creator: Nelson, Kym D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-38494-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/10/2014 12:26:56 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Job ID: 180-38494-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The samples were received on 11/5/2014 10:04 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.0º C and 2.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 124320. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-38494-1	OC-FRAC 1. 110414	Water	11/04/14 10:00	11/05/14 10:04

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Client Sample ID: OC-FRAC 1. 110414
Date Collected: 11/04/14 10:00
Date Received: 11/05/14 10:04

Lab Sample ID: 180-38494-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	124320	11/07/14 11:10	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	124488	11/10/14 11:02	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		124141	11/06/14 13:35	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	124080	11/06/14 03:43	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	124259	11/06/14 20:15	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	262986	11/06/14 15:00	BAH	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	262996	11/06/14 17:40	BAH	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	262792		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	11/05/14 17:43		
							(End)	11/05/14 17:45		
Total/NA	Analysis	SM 4500 Cl F		1			262843	11/05/14 15:26	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

BAH = Bridget House

Batch Type: Analysis

BAH = Bridget House

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38494-1

Client Sample ID: OC-FRAC 1. 110414
Date Collected: 11/04/14 10:00
Date Received: 11/05/14 10:04

Lab Sample ID: 180-38494-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/07/14 11:10	11/10/14 11:02	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		11/07/14 11:10	11/10/14 11:02	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/07/14 11:10	11/10/14 11:02	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/07/14 11:10	11/10/14 11:02	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/07/14 11:10	11/10/14 11:02	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/07/14 11:10	11/10/14 11:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*51*		*16 - 122*	*11/07/14 11:10*	*11/10/14 11:02*	*1*
2-Fluorobiphenyl	*50*		*19 - 107*	*11/07/14 11:10*	*11/10/14 11:02*	*1*
2-Fluorophenol (Surr)	*47*		*10 - 111*	*11/07/14 11:10*	*11/10/14 11:02*	*1*
Nitrobenzene-d5 (Surr)	*55*		*23 - 112*	*11/07/14 11:10*	*11/10/14 11:02*	*1*
Phenol-d5 (Surr)	*57*		*15 - 112*	*11/07/14 11:10*	*11/10/14 11:02*	*1*
Terphenyl-d14	*65*		*10 - 132*	*11/07/14 11:10*	*11/10/14 11:02*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**230**		5.0	0.98	mg/L			11/06/14 13:35	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/06/14 03:43	11/06/14 20:15	1
Iron	ND		50	9.5	ug/L		11/06/14 03:43	11/06/14 20:15	1
Nickel	ND		10	0.51	ug/L		11/06/14 03:43	11/06/14 20:15	1
Zinc	**8.9**	**J**	10	1.0	ug/L		11/06/14 03:43	11/06/14 20:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/06/14 15:00	11/06/14 17:40	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/05/14 17:43	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/05/14 15:26	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-124320/1-A
Matrix: Water
Analysis Batch: 124488

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 124320

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/07/14 11:10	11/10/14 08:44	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/07/14 11:10	11/10/14 08:44	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/07/14 11:10	11/10/14 08:44	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/07/14 11:10	11/10/14 08:44	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/07/14 11:10	11/10/14 08:44	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/07/14 11:10	11/10/14 08:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*47*		*16 - 122*	*11/07/14 11:10*	*11/10/14 08:44*	*1*
2-Fluorobiphenyl	*52*		*19 - 107*	*11/07/14 11:10*	*11/10/14 08:44*	*1*
2-Fluorophenol (Surr)	*56*		*10 - 111*	*11/07/14 11:10*	*11/10/14 08:44*	*1*
Nitrobenzene-d5 (Surr)	*56*		*23 - 112*	*11/07/14 11:10*	*11/10/14 08:44*	*1*
Phenol-d5 (Surr)	*62*		*15 - 112*	*11/07/14 11:10*	*11/10/14 08:44*	*1*
Terphenyl-d14	*60*		*10 - 132*	*11/07/14 11:10*	*11/10/14 08:44*	*1*

Lab Sample ID: LCS 180-124320/2-A
Matrix: Water
Analysis Batch: 124488

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 124320

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			20.0	14.7		ug/L		74	20 - 116		
Butyl benzyl phthalate			20.0	14.6		ug/L		73	36 - 108		
Di-n-butyl phthalate			20.0	13.8		ug/L		69	37 - 111		
Diethyl phthalate			20.0	13.0		ug/L		65	36 - 109		
Dimethyl phthalate			20.0	13.4		ug/L		67	37 - 106		
Di-n-octyl phthalate			20.0	15.3		ug/L		76	11 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*57*		*16 - 122*
2-Fluorobiphenyl	*57*		*19 - 107*
2-Fluorophenol (Surr)	*66*		*10 - 111*
Nitrobenzene-d5 (Surr)	*63*		*23 - 112*
Phenol-d5 (Surr)	*72*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Lab Sample ID: LCSD 180-124320/3-A
Matrix: Water
Analysis Batch: 124488

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124320

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	15.6		ug/L		78	20 - 116	6	40
Butyl benzyl phthalate			20.0	15.6		ug/L		78	36 - 108	7	40
Di-n-butyl phthalate			20.0	14.2		ug/L		71	37 - 111	3	38
Diethyl phthalate			20.0	13.5		ug/L		68	36 - 109	4	39
Dimethyl phthalate			20.0	14.0		ug/L		70	37 - 106	4	42
Di-n-octyl phthalate			20.0	15.9		ug/L		79	11 - 127	4	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-124320/3-A
Matrix: Water
Analysis Batch: 124488

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124320

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*58*		*16 - 122*
2-Fluorobiphenyl	*60*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*
Phenol-d5 (Surr)	*75*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-124141/6
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			11/06/14 08:53	1

Lab Sample ID: LCS 180-124141/5
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.3		mg/L		97	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-124080/1-A
Matrix: Water
Analysis Batch: 124259

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 124080

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/06/14 03:43	11/06/14 20:05	1
Iron	ND		50	9.5	ug/L		11/06/14 03:43	11/06/14 20:05	1
Nickel	ND		10	0.51	ug/L		11/06/14 03:43	11/06/14 20:05	1
Zinc	ND		10	1.0	ug/L		11/06/14 03:43	11/06/14 20:05	1

Lab Sample ID: LCS 180-124080/2-A
Matrix: Water
Analysis Batch: 124259

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 124080

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	538		ug/L		108	85 - 115
Iron	1000	1050		ug/L		105	85 - 115
Nickel	500	506		ug/L		101	85 - 115
Zinc	500	499		ug/L		100	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-38494-1 MS — **Client Sample ID: OC-FRAC 1. 110414**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 124259 — **Prep Batch: 124080**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	561		ug/L		112	70 - 130
Iron	ND		1000	1080		ug/L		108	70 - 130
Nickel	ND		500	523		ug/L		105	70 - 130
Zinc	8.9	J	500	520		ug/L		102	70 - 130

Lab Sample ID: 180-38494-1 MSD — **Client Sample ID: OC-FRAC 1. 110414**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 124259 — **Prep Batch: 124080**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	563		ug/L		113	70 - 130	0	20
Iron	ND		1000	1060		ug/L		106	70 - 130	2	20
Nickel	ND		500	517		ug/L		103	70 - 130	1	20
Zinc	8.9	J	500	510		ug/L		100	70 - 130	2	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-262986/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 262996 — **Prep Batch: 262986**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/06/14 15:00	11/06/14 17:38	1

Lab Sample ID: LCS 500-262986/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 262996 — **Prep Batch: 262986**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0912		mg/L		91	90 - 110

Lab Sample ID: 180-38494-1 MS — **Client Sample ID: OC-FRAC 1. 110414**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 262996 — **Prep Batch: 262986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0953		mg/L		95	75 - 125

Lab Sample ID: 180-38494-1 MSD — **Client Sample ID: OC-FRAC 1. 110414**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 262996 — **Prep Batch: 262986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0955		mg/L		96	75 - 125	0	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-262792/1
Matrix: Water
Analysis Batch: 262792

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/05/14 17:30	1

Lab Sample ID: LCS 500-262792/2
Matrix: Water
Analysis Batch: 262792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	191		mg/L		95	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-262843/1
Matrix: Water
Analysis Batch: 262843

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/05/14 15:25	1

Lab Sample ID: 180-38494-1 DU
Matrix: Water
Analysis Batch: 262843

Client Sample ID: OC-FRAC 1. 110414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND		ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 124320

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	3520C	
LCS 180-124320/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-124320/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-124320/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 124488

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	8270C LL	124320
LCS 180-124320/2-A	Lab Control Sample	Total/NA	Water	8270C LL	124320
LCSD 180-124320/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	124320
MB 180-124320/1-A	Method Blank	Total/NA	Water	8270C LL	124320

HPLC/IC

Analysis Batch: 124141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	300.0	
LCS 180-124141/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-124141/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 124080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total Recoverable	Water	200.7	
180-38494-1 MS	OC-FRAC 1. 110414	Total Recoverable	Water	200.7	
180-38494-1 MSD	OC-FRAC 1. 110414	Total Recoverable	Water	200.7	
LCS 180-124080/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-124080/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 124259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total Recoverable	Water	200.7 Rev 4.4	124080
180-38494-1 MS	OC-FRAC 1. 110414	Total Recoverable	Water	200.7 Rev 4.4	124080
180-38494-1 MSD	OC-FRAC 1. 110414	Total Recoverable	Water	200.7 Rev 4.4	124080
LCS 180-124080/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	124080
MB 180-124080/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	124080

General Chemistry

Analysis Batch: 262792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	SM 2540D	
LCS 500-262792/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-262792/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 262843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	SM 4500 Cl F	
180-38494-1 DU	OC-FRAC 1. 110414	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 262843 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-262843/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 262986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	Distill/Phenol	
180-38494-1 MS	OC-FRAC 1. 110414	Total/NA	Water	Distill/Phenol	
180-38494-1 MSD	OC-FRAC 1. 110414	Total/NA	Water	Distill/Phenol	
LCS 500-262986/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-262986/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 262996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38494-1	OC-FRAC 1. 110414	Total/NA	Water	420.4	262986
180-38494-1 MS	OC-FRAC 1. 110414	Total/NA	Water	420.4	262986
180-38494-1 MSD	OC-FRAC 1. 110414	Total/NA	Water	420.4	262986
LCS 500-262986/2-A	Lab Control Sample	Total/NA	Water	420.4	262986
MB 500-262986/1-A	Method Blank	Total/NA	Water	420.4	262986

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-38494 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 1 - 110414	11-4-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	11-4-14			11-4-14 1145	TA
2		11-4-14 1630		J Watson	11-5-14 10:04	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38494-1

Login Number: 38494

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38494-1

Login Number: 38494

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38494-1

Login Number: 38494
List Number: 3
Creator: Scott, Sherri L

List Source: TestAmerica Chicago
List Creation: 11/05/14 03:37 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-2.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-38550-1
Client Project/Site: Wilmington Plant B RPG F2

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/11/2014 2:27:10 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Job ID: 180-38550-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 11/6/2014 9:05 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.2º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Client Sample ID: FRAC 2 - 110514 **Lab Sample ID: 180-38550-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	230		5.0	0.98	mg/L	5		300.0	Total/NA
Zinc	47	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Client Sample ID: FRAC 2 - 110514
Date Collected: 11/05/14 11:30
Date Received: 11/06/14 09:05

Lab Sample ID: 180-38550-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/06/14 11:26	11/07/14 16:24	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		11/06/14 11:26	11/07/14 16:24	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/06/14 11:26	11/07/14 16:24	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/06/14 11:26	11/07/14 16:24	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/06/14 11:26	11/07/14 16:24	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/06/14 11:26	11/07/14 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*87*		*16 - 122*	*11/06/14 11:26*	*11/07/14 16:24*	*1*
2-Fluorobiphenyl	*67*		*19 - 107*	*11/06/14 11:26*	*11/07/14 16:24*	*1*
2-Fluorophenol (Surr)	*59*		*10 - 111*	*11/06/14 11:26*	*11/07/14 16:24*	*1*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*	*11/06/14 11:26*	*11/07/14 16:24*	*1*
Phenol-d5 (Surr)	*58*		*15 - 112*	*11/06/14 11:26*	*11/07/14 16:24*	*1*
Terphenyl-d14	*71*		*10 - 132*	*11/06/14 11:26*	*11/07/14 16:24*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**230**		5.0	0.98	mg/L			11/06/14 17:42	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/09/14 05:08	11/10/14 15:12	1
Iron	ND		50	9.5	ug/L		11/09/14 05:08	11/10/14 15:12	1
Nickel	ND		10	0.51	ug/L		11/09/14 05:08	11/10/14 15:12	1
Zinc	**47**	**B**	10	1.0	ug/L		11/09/14 05:08	11/10/14 15:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0053	0.0023	mg/L		11/06/14 15:00	11/06/14 17:43	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/06/14 12:20	1
Chlorine, Total Residual	ND	H	0.20	0.20	mg/L			11/07/14 15:11	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-38550-1	FRAC 2 - 110514	87	67	59	71	58	71		
LCS 180-124176/2-A	Lab Control Sample	81	69	70	72	66	70		
LCSD 180-124176/3-A	Lab Control Sample Dup	84	72	73	77	69	74		
MB 180-124176/1-A	Method Blank	81	62	62	69	61	70		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-124176/1-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 124176

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/06/14 11:26	11/07/14 13:34	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/06/14 11:26	11/07/14 13:34	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/06/14 11:26	11/07/14 13:34	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/06/14 11:26	11/07/14 13:34	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/06/14 11:26	11/07/14 13:34	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/06/14 11:26	11/07/14 13:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*81*		*16 - 122*	*11/06/14 11:26*	*11/07/14 13:34*	*1*
2-Fluorobiphenyl	*62*		*19 - 107*	*11/06/14 11:26*	*11/07/14 13:34*	*1*
2-Fluorophenol (Surr)	*62*		*10 - 111*	*11/06/14 11:26*	*11/07/14 13:34*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*	*11/06/14 11:26*	*11/07/14 13:34*	*1*
Phenol-d5 (Surr)	*61*		*15 - 112*	*11/06/14 11:26*	*11/07/14 13:34*	*1*
Terphenyl-d14	*70*		*10 - 132*	*11/06/14 11:26*	*11/07/14 13:34*	*1*

Lab Sample ID: LCS 180-124176/2-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 124176

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.0		ug/L		75	20 - 116
Butyl benzyl phthalate	20.0	15.1		ug/L		75	36 - 108
Di-n-butyl phthalate	20.0	14.1		ug/L		71	37 - 111
Diethyl phthalate	20.0	15.1		ug/L		75	36 - 109
Dimethyl phthalate	20.0	14.8		ug/L		74	37 - 106
Di-n-octyl phthalate	20.0	14.0		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*81*		*16 - 122*
2-Fluorobiphenyl	*69*		*19 - 107*
2-Fluorophenol (Surr)	*70*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*66*		*15 - 112*
Terphenyl-d14	*70*		*10 - 132*

Lab Sample ID: LCSD 180-124176/3-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124176

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		77	20 - 116	2	40
Butyl benzyl phthalate	20.0	15.4		ug/L		77	36 - 108	2	40
Di-n-butyl phthalate	20.0	14.4		ug/L		72	37 - 111	2	38
Diethyl phthalate	20.0	15.3		ug/L		76	36 - 109	1	39
Dimethyl phthalate	20.0	15.0		ug/L		75	37 - 106	1	42
Di-n-octyl phthalate	20.0	14.3		ug/L		71	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-124176/3-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124176

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*84*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*73*		*10 - 111*
Nitrobenzene-d5 (Surr)	*77*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*74*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-124141/6
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			11/06/14 08:53	1

Lab Sample ID: LCS 180-124141/5
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.3		mg/L		97	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-124422/1-A
Matrix: Water
Analysis Batch: 124618

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 124422

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/09/14 05:08	11/10/14 15:02	1
Iron	ND		50	9.5	ug/L		11/09/14 05:08	11/10/14 15:02	1
Nickel	ND		10	0.51	ug/L		11/09/14 05:08	11/10/14 15:02	1
Zinc	2.08	J	10	1.0	ug/L		11/09/14 05:08	11/10/14 15:02	1

Lab Sample ID: LCS 180-124422/2-A
Matrix: Water
Analysis Batch: 124618

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 124422

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	535		ug/L		107	85 - 115
Iron	1000	992		ug/L		99	85 - 115
Nickel	500	511		ug/L		102	85 - 115
Zinc	500	503		ug/L		101	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-38550-1 MS
Matrix: Water
Analysis Batch: 124618

Client Sample ID: FRAC 2 - 110514
Prep Type: Total Recoverable
Prep Batch: 124422

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	543		ug/L		109	70 - 130
Iron	ND		1000	985		ug/L		99	70 - 130
Nickel	ND		500	516		ug/L		103	70 - 130
Zinc	47	B	500	540		ug/L		99	70 - 130

Lab Sample ID: 180-38550-1 MSD
Matrix: Water
Analysis Batch: 124618

Client Sample ID: FRAC 2 - 110514
Prep Type: Total Recoverable
Prep Batch: 124422

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	558		ug/L		112	70 - 130	3	20
Iron	ND		1000	1000		ug/L		100	70 - 130	2	20
Nickel	ND		500	527		ug/L		105	70 - 130	2	20
Zinc	47	B	500	556		ug/L		102	70 - 130	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-262986/1-A
Matrix: Water
Analysis Batch: 262996

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 262986

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/06/14 15:00	11/06/14 17:38	1

Lab Sample ID: LCS 500-262986/2-A
Matrix: Water
Analysis Batch: 262996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 262986

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0912		mg/L		91	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-262923/1
Matrix: Water
Analysis Batch: 262923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/06/14 11:25	1

Lab Sample ID: LCS 500-262923/2
Matrix: Water
Analysis Batch: 262923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	193		mg/L		96	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-263183/1
Matrix: Water
Analysis Batch: 263183

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/07/14 15:10	1

Lab Sample ID: 180-38550-1 DU
Matrix: Water
Analysis Batch: 263183

Client Sample ID: FRAC 2 - 110514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	H		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 124176

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	3520C	
LCS 180-124176/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-124176/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-124176/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 124289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	8270C LL	124176
LCS 180-124176/2-A	Lab Control Sample	Total/NA	Water	8270C LL	124176
LCSD 180-124176/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	124176
MB 180-124176/1-A	Method Blank	Total/NA	Water	8270C LL	124176

HPLC/IC

Analysis Batch: 124141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	300.0	
LCS 180-124141/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-124141/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 124422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total Recoverable	Water	200.7	
180-38550-1 MS	FRAC 2 - 110514	Total Recoverable	Water	200.7	
180-38550-1 MSD	FRAC 2 - 110514	Total Recoverable	Water	200.7	
LCS 180-124422/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-124422/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 124618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total Recoverable	Water	200.7 Rev 4.4	124422
180-38550-1 MS	FRAC 2 - 110514	Total Recoverable	Water	200.7 Rev 4.4	124422
180-38550-1 MSD	FRAC 2 - 110514	Total Recoverable	Water	200.7 Rev 4.4	124422
LCS 180-124422/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	124422
MB 180-124422/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	124422

General Chemistry

Analysis Batch: 262923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	SM 2540D	
LCS 500-262923/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-262923/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 262986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	Distill/Phenol	
LCS 500-262986/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 262986 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-262986/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 262996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	420.4	262986
LCS 500-262986/2-A	Lab Control Sample	Total/NA	Water	420.4	262986
MB 500-262986/1-A	Method Blank	Total/NA	Water	420.4	262986

Analysis Batch: 263183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38550-1	FRAC 2 - 110514	Total/NA	Water	SM 4500 Cl F	
180-38550-1 DU	FRAC 2 - 110514	Total/NA	Water	SM 4500 Cl F	
MB 500-263183/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Client Sample ID: FRAC 2 - 110514
Date Collected: 11/05/14 11:30
Date Received: 11/06/14 09:05

Lab Sample ID: 180-38550-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	124176	11/06/14 11:26	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	124289	11/07/14 16:24	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		124141	11/06/14 17:42	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	124422	11/09/14 05:08	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	124618	11/10/14 15:12	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	106 mL	262986	11/06/14 15:00	BAH	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	106 mL	262996	11/06/14 17:43	BAH	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	262923		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 11/06/14 12:20		
								(End) 11/06/14 12:22		
Total/NA	Analysis	SM 4500 Cl F		1			263183	11/07/14 15:11	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

BAH = Bridget House

Batch Type: Analysis

BAH = Bridget House

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG F2

TestAmerica Job ID: 180-38550-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-38550-1	FRAC 2 - 110514	Water	11/05/14 11:30	11/06/14 09:05

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L JOHNSON	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:

Address: 51 Eames street	Due Date Requested:
City: Wilmington	TAT Requested (days): A.S.A.P.
State, Zip: MA, 01887	
Phone: 978 658 6121	PO #: REWI0020
Email: beguichard@olin.com	WO #:
Project Name: Wilmington Plant B RPG F2	Project #: 48006853
Site: WILMINGTON MA	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	300.0_28D - Chloride	200.7 - AsNiZnFe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	D	S	N	N	X	
FRAC 2 - 110514	11-5-14	1130	G	Water			X	X	X	X	X	X		
				Water										

180-38550 Chain of Custody

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 11-5-14	Company	Received by:	Date/Time: 11-5-14 1230	Company		
Relinquished by:	Date/Time: 11-5-14 1630	Company	Received by:	Date/Time: 11/6/14 0905	Company		
Relinquished by	Date/Time:	Company	Received by	Date/Time:	Company		

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38550-1

Login Number: 38550

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Skowronek, Elyse N

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-38800-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/17/2014 12:19:50 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Job ID: 180-38800-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 11/12/2014 10:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 300.28: The method blank for batch 124787 contained ranges above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Client Sample ID: OC FRAC 3. 111114

Lab Sample ID: 180-38800-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.33	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.15	J	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	220	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.2	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	8.9	J	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC FRAC 3. 111114
Date Collected: 11/11/14 11:00
Date Received: 11/12/14 10:40

Lab Sample ID: 180-38800-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/12/14 12:27	11/13/14 22:15	1
Butyl benzyl phthalate	**0.33**	**J**	0.94	0.13	ug/L		11/12/14 12:27	11/13/14 22:15	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/12/14 12:27	11/13/14 22:15	1
Diethyl phthalate	**0.15**	**J**	0.94	0.14	ug/L		11/12/14 12:27	11/13/14 22:15	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/12/14 12:27	11/13/14 22:15	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/12/14 12:27	11/13/14 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*64*		*16 - 122*	*11/12/14 12:27*	*11/13/14 22:15*	*1*
2-Fluorobiphenyl	*61*		*19 - 107*	*11/12/14 12:27*	*11/13/14 22:15*	*1*
2-Fluorophenol (Surr)	*53*		*10 - 111*	*11/12/14 12:27*	*11/13/14 22:15*	*1*
Nitrobenzene-d5 (Surr)	*62*		*23 - 112*	*11/12/14 12:27*	*11/13/14 22:15*	*1*
Phenol-d5 (Surr)	*55*		*15 - 112*	*11/12/14 12:27*	*11/13/14 22:15*	*1*
Terphenyl-d14	*71*		*10 - 132*	*11/12/14 12:27*	*11/13/14 22:15*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**220**	**B**	5.0	0.98	mg/L			11/12/14 14:08	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.2**	**J**	10	3.0	ug/L		11/13/14 08:19	11/14/14 09:16	1
Iron	ND		50	9.5	ug/L		11/13/14 08:19	11/14/14 09:16	1
Nickel	ND		10	0.51	ug/L		11/13/14 08:19	11/14/14 09:16	1
Zinc	**8.9**	**J**	10	1.0	ug/L		11/13/14 08:19	11/14/14 09:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		11/14/14 14:04	11/14/14 15:12	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/13/14 11:46	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/12/14 11:31	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-38800-1	OC FRAC 3. 111114	64	61	53	62	55	71		
LCS 180-124863/2-A	Lab Control Sample	75	70	72	71	71	67		
LCSD 180-124863/3-A	Lab Control Sample Dup	81	75	76	77	76	73		
MB 180-124863/1-A	Method Blank	63	66	67	65	69	75		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-124863/1-A
Matrix: Water
Analysis Batch: 124986

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 124863

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/12/14 12:27	11/13/14 13:17	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/12/14 12:27	11/13/14 13:17	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/12/14 12:27	11/13/14 13:17	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/12/14 12:27	11/13/14 13:17	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/12/14 12:27	11/13/14 13:17	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/12/14 12:27	11/13/14 13:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*63*		*16 - 122*	*11/12/14 12:27*	*11/13/14 13:17*	*1*
2-Fluorobiphenyl	*66*		*19 - 107*	*11/12/14 12:27*	*11/13/14 13:17*	*1*
2-Fluorophenol (Surr)	*67*		*10 - 111*	*11/12/14 12:27*	*11/13/14 13:17*	*1*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*	*11/12/14 12:27*	*11/13/14 13:17*	*1*
Phenol-d5 (Surr)	*69*		*15 - 112*	*11/12/14 12:27*	*11/13/14 13:17*	*1*
Terphenyl-d14	*75*		*10 - 132*	*11/12/14 12:27*	*11/13/14 13:17*	*1*

Lab Sample ID: LCS 180-124863/2-A
Matrix: Water
Analysis Batch: 124986

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 124863

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		77	20 - 116
Butyl benzyl phthalate	20.0	15.1		ug/L		75	36 - 108
Di-n-butyl phthalate	20.0	15.2		ug/L		76	37 - 111
Diethyl phthalate	20.0	14.8		ug/L		74	36 - 109
Dimethyl phthalate	20.0	14.5		ug/L		72	37 - 106
Di-n-octyl phthalate	20.0	16.3		ug/L		81	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*
2-Fluorobiphenyl	*70*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*
Phenol-d5 (Surr)	*71*		*15 - 112*
Terphenyl-d14	*67*		*10 - 132*

Lab Sample ID: LCSD 180-124863/3-A
Matrix: Water
Analysis Batch: 124986

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124863

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	16.4		ug/L		82	20 - 116	7	40
Butyl benzyl phthalate	20.0	16.4		ug/L		82	36 - 108	9	40
Di-n-butyl phthalate	20.0	16.1		ug/L		81	37 - 111	6	38
Diethyl phthalate	20.0	15.7		ug/L		79	36 - 109	6	39
Dimethyl phthalate	20.0	15.5		ug/L		77	37 - 106	6	42
Di-n-octyl phthalate	20.0	17.9		ug/L		90	11 - 127	10	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-124863/3-A
Matrix: Water
Analysis Batch: 124986

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 124863

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*81*		*16 - 122*
2-Fluorobiphenyl	*75*		*19 - 107*
2-Fluorophenol (Surr)	*76*		*10 - 111*
Nitrobenzene-d5 (Surr)	*77*		*23 - 112*
Phenol-d5 (Surr)	*76*		*15 - 112*
Terphenyl-d14	*73*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-124787/6
Matrix: Water
Analysis Batch: 124787

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.637	J	1.0	0.20	mg/L			11/12/14 07:28	1

Lab Sample ID: LCS 180-124787/5
Matrix: Water
Analysis Batch: 124787

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.7		mg/L		99	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-124975/1-A
Matrix: Water
Analysis Batch: 125156

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 124975

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/13/14 08:19	11/14/14 09:06	1
Iron	ND		50	9.5	ug/L		11/13/14 08:19	11/14/14 09:06	1
Nickel	ND		10	0.51	ug/L		11/13/14 08:19	11/14/14 09:06	1
Zinc	ND		10	1.0	ug/L		11/13/14 08:19	11/14/14 09:06	1

Lab Sample ID: LCS 180-124975/2-A
Matrix: Water
Analysis Batch: 125156

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 124975

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	518		ug/L		104	85 - 115
Iron	1000	993		ug/L		99	85 - 115
Nickel	500	495		ug/L		99	85 - 115
Zinc	500	496		ug/L		99	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-38800-1 MS — **Client Sample ID: OC FRAC 3. 111114**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 125156 — **Prep Batch: 124975**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.2	J	500	550		ug/L		109	70 - 130
Iron	ND		1000	1020		ug/L		102	70 - 130
Nickel	ND		500	514		ug/L		103	70 - 130
Zinc	8.9	J	500	513		ug/L		101	70 - 130

Lab Sample ID: 180-38800-1 MSD — **Client Sample ID: OC FRAC 3. 111114**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 125156 — **Prep Batch: 124975**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.2	J	500	548		ug/L		109	70 - 130	0	20
Iron	ND		1000	1010		ug/L		101	70 - 130	0	20
Nickel	ND		500	513		ug/L		103	70 - 130	0	20
Zinc	8.9	J	500	514		ug/L		101	70 - 130	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-264300/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264328 — **Prep Batch: 264300**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/14/14 14:04	11/14/14 14:58	1

Lab Sample ID: LCS 500-264300/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264328 — **Prep Batch: 264300**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0922		mg/L		92	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-264062/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264062

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/13/14 11:20	1

Lab Sample ID: LCS 500-264062/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264062

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	195		mg/L		97	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-263830/1
Matrix: Water
Analysis Batch: 263830

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/12/14 11:30	1

Lab Sample ID: 180-38800-1 DU
Matrix: Water
Analysis Batch: 263830

Client Sample ID: OC FRAC 3. 111114
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND			ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 124863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	3520C	
LCS 180-124863/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-124863/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-124863/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 124986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	8270C LL	124863
LCS 180-124863/2-A	Lab Control Sample	Total/NA	Water	8270C LL	124863
LCSD 180-124863/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	124863
MB 180-124863/1-A	Method Blank	Total/NA	Water	8270C LL	124863

HPLC/IC

Analysis Batch: 124787

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	300.0	
LCS 180-124787/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-124787/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 124975

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total Recoverable	Water	200.7	
180-38800-1 MS	OC FRAC 3. 111114	Total Recoverable	Water	200.7	
180-38800-1 MSD	OC FRAC 3. 111114	Total Recoverable	Water	200.7	
LCS 180-124975/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-124975/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 125156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total Recoverable	Water	200.7 Rev 4.4	124975
180-38800-1 MS	OC FRAC 3. 111114	Total Recoverable	Water	200.7 Rev 4.4	124975
180-38800-1 MSD	OC FRAC 3. 111114	Total Recoverable	Water	200.7 Rev 4.4	124975
LCS 180-124975/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	124975
MB 180-124975/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	124975

General Chemistry

Analysis Batch: 263830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	SM 4500 Cl F	
180-38800-1 DU	OC FRAC 3. 111114	Total/NA	Water	SM 4500 Cl F	
MB 500-263830/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 264062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	SM 2540D	
LCS 500-264062/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 264062 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-264062/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 264300

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	Distill/Phenol	
LCS 500-264300/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-264300/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 264328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38800-1	OC FRAC 3. 111114	Total/NA	Water	420.4	264300
LCS 500-264300/2-A	Lab Control Sample	Total/NA	Water	420.4	264300
MB 500-264300/1-A	Method Blank	Total/NA	Water	420.4	264300

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Client Sample ID: OC FRAC 3. 111114
Date Collected: 11/11/14 11:00
Date Received: 11/12/14 10:40

Lab Sample ID: 180-38800-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	124863	11/12/14 12:27	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	124986	11/13/14 22:15	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL		124787	11/12/14 14:08	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	124975	11/13/14 08:19	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	125156	11/14/14 09:16	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	264300	11/14/14 14:04	BAH	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	264328	11/14/14 15:12	BAH	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	264062		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 11/13/14 11:46		
								(End) 11/13/14 11:48		
Total/NA	Analysis	SM 4500 Cl F		1			263830	11/12/14 11:31	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

BAH = Bridget House

Batch Type: Analysis

BAH = Bridget House

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38800-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-38800-1	OC FRAC 3. 111114	Water	11/11/14 11:00	11/12/14 10:40

BNA 1 LEE metab 5BB 8DD

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-38800 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	COC No:
Company: Olin Corporation			
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978 658 6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site: WILMINGTON MA	SSOW#:		

Analysis Re

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 3 · 111114	11-11-14	1100	G	Water			X		X	X	X	X	X		
				Water											

C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 11·11·14	Company	Received by: [signature] Date/Time: 11/11/14 14:00 Company TA
Relinquished by: [signature]	Date/Time: 11/11/14 16:00	Company TA	Received by: DeWhiteWatson Date/Time: 11-12-14 10:45 Company AP
Relinquished by	Date/Time:	Company	Received by: Date/Time: Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

11/17/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38800-1

Login Number: 38800

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38800-1

Login Number: 38800

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38800-1

Login Number: 38800
List Number: 3
Creator: James, Jeff A

List Source: TestAmerica Chicago
List Creation: 11/13/14 08:30 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-38923-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
11/19/2014 2:10:33 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Job ID: 180-38923-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-38923-1

Receipt
The sample was received on 11/14/2014 9:25 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.7º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 125158. 3520_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-38923-1	OC-FRAC 5- 111314	Water	11/13/14 11:00	11/14/14 09:25

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Client Sample ID: OC-FRAC 5- 111314
Date Collected: 11/13/14 11:00
Date Received: 11/14/14 09:25

Lab Sample ID: 180-38923-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	125158	11/14/14 12:55	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	125342	11/17/14 14:06	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		125098	11/14/14 21:27	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	125306	11/17/14 05:24	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	125428	11/17/14 13:53	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	105 mL	264613	11/17/14 14:45	BAH	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	105 mL	264659	11/17/14 15:53	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	264556		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	11/17/14 11:44		
							(End)	11/17/14 11:46		
Total/NA	Analysis	SM 4500 Cl F		1			264332	11/14/14 10:26	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

BAH = Bridget House

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

Client Sample ID: OC-FRAC 5- 111314
Date Collected: 11/13/14 11:00
Date Received: 11/14/14 09:25

Lab Sample ID: 180-38923-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/14/14 12:55	11/17/14 14:06	1
Butyl benzyl phthalate	**0.13**	**J**	0.94	0.13	ug/L		11/14/14 12:55	11/17/14 14:06	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/14/14 12:55	11/17/14 14:06	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/14/14 12:55	11/17/14 14:06	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/14/14 12:55	11/17/14 14:06	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/14/14 12:55	11/17/14 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*	*11/14/14 12:55*	*11/17/14 14:06*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*11/14/14 12:55*	*11/17/14 14:06*	*1*
2-Fluorophenol (Surr)	*52*		*10 - 111*	*11/14/14 12:55*	*11/17/14 14:06*	*1*
Nitrobenzene-d5 (Surr)	*63*		*23 - 112*	*11/14/14 12:55*	*11/17/14 14:06*	*1*
Phenol-d5 (Surr)	*55*		*15 - 112*	*11/14/14 12:55*	*11/17/14 14:06*	*1*
Terphenyl-d14	*70*		*10 - 132*	*11/14/14 12:55*	*11/17/14 14:06*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**		5.0	0.98	mg/L			11/14/14 21:27	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/17/14 05:24	11/17/14 13:53	1
Iron	ND		50	9.5	ug/L		11/17/14 05:24	11/17/14 13:53	1
Nickel	ND		10	0.51	ug/L		11/17/14 05:24	11/17/14 13:53	1
Zinc	**15**		10	1.0	ug/L		11/17/14 05:24	11/17/14 13:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0053	0.0023	mg/L		11/17/14 14:45	11/17/14 15:53	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/17/14 11:44	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/14/14 10:26	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-125158/1-A
Matrix: Water
Analysis Batch: 125342

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 125158

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/14/14 10:35	11/17/14 11:17	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/14/14 10:35	11/17/14 11:17	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/14/14 10:35	11/17/14 11:17	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/14/14 10:35	11/17/14 11:17	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/14/14 10:35	11/17/14 11:17	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/14/14 10:35	11/17/14 11:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*11/14/14 10:35*	*11/17/14 11:17*	*1*
2-Fluorobiphenyl	*59*		*19 - 107*	*11/14/14 10:35*	*11/17/14 11:17*	*1*
2-Fluorophenol (Surr)	*60*		*10 - 111*	*11/14/14 10:35*	*11/17/14 11:17*	*1*
Nitrobenzene-d5 (Surr)	*60*		*23 - 112*	*11/14/14 10:35*	*11/17/14 11:17*	*1*
Phenol-d5 (Surr)	*66*		*15 - 112*	*11/14/14 10:35*	*11/17/14 11:17*	*1*
Terphenyl-d14	*66*		*10 - 132*	*11/14/14 10:35*	*11/17/14 11:17*	*1*

Lab Sample ID: LCS 180-125158/2-A
Matrix: Water
Analysis Batch: 125342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 125158

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.7		ug/L		79	20 - 116
Butyl benzyl phthalate	20.0	15.7		ug/L		79	36 - 108
Di-n-butyl phthalate	20.0	14.7		ug/L		73	37 - 111
Diethyl phthalate	20.0	13.6		ug/L		68	36 - 109
Dimethyl phthalate	20.0	14.3		ug/L		72	37 - 106
Di-n-octyl phthalate	20.0	16.0		ug/L		80	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*
2-Fluorobiphenyl	*62*		*19 - 107*
2-Fluorophenol (Surr)	*68*		*10 - 111*
Nitrobenzene-d5 (Surr)	*67*		*23 - 112*
Phenol-d5 (Surr)	*72*		*15 - 112*
Terphenyl-d14	*67*		*10 - 132*

Lab Sample ID: LCSD 180-125158/3-A
Matrix: Water
Analysis Batch: 125342

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125158

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.4		ug/L		77	20 - 116	2	40
Butyl benzyl phthalate	20.0	15.6		ug/L		78	36 - 108	1	40
Di-n-butyl phthalate	20.0	14.5		ug/L		72	37 - 111	1	38
Diethyl phthalate	20.0	13.3		ug/L		67	36 - 109	2	39
Dimethyl phthalate	20.0	14.0		ug/L		70	37 - 106	2	42
Di-n-octyl phthalate	20.0	15.6		ug/L		78	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-125158/3-A
Matrix: Water
Analysis Batch: 125342

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125158

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*64*		*16 - 122*
2-Fluorobiphenyl	*61*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*
Phenol-d5 (Surr)	*74*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-125098/50
Matrix: Water
Analysis Batch: 125098

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			11/14/14 19:09	1

Lab Sample ID: LCS 180-125098/49
Matrix: Water
Analysis Batch: 125098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	49.5		mg/L		99	90 - 110		

Lab Sample ID: 180-38923-1 MS
Matrix: Water
Analysis Batch: 125098

Client Sample ID: OC-FRAC 5- 111314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	210		125	343		mg/L		105	80 - 120		

Lab Sample ID: 180-38923-1 MSD
Matrix: Water
Analysis Batch: 125098

Client Sample ID: OC-FRAC 5- 111314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	210		125	342		mg/L		104	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-125306/1-A
Matrix: Water
Analysis Batch: 125428

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/17/14 05:24	11/17/14 13:43	1
Iron	ND		50	9.5	ug/L		11/17/14 05:24	11/17/14 13:43	1
Nickel	ND		10	0.51	ug/L		11/17/14 05:24	11/17/14 13:43	1
Zinc	ND		10	1.0	ug/L		11/17/14 05:24	11/17/14 13:43	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-125306/2-A
Matrix: Water
Analysis Batch: 125428

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	540		ug/L		108	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	512		ug/L		102	85 - 115
Zinc	500	521		ug/L		104	85 - 115

Lab Sample ID: 180-38923-1 MS
Matrix: Water
Analysis Batch: 125428

Client Sample ID: OC-FRAC 5- 111314
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	550		ug/L		110	70 - 130
Iron	ND		1000	1040		ug/L		104	70 - 130
Nickel	ND		500	516		ug/L		103	70 - 130
Zinc	15		500	529		ug/L		103	70 - 130

Lab Sample ID: 180-38923-1 MSD
Matrix: Water
Analysis Batch: 125428

Client Sample ID: OC-FRAC 5- 111314
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	549		ug/L		110	70 - 130	0	20
Iron	ND		1000	1040		ug/L		104	70 - 130	0	20
Nickel	ND		500	514		ug/L		103	70 - 130	0	20
Zinc	15		500	525		ug/L		102	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-264613/1-A
Matrix: Water
Analysis Batch: 264659

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 264613

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/17/14 14:45	11/17/14 15:51	1

Lab Sample ID: LCS 500-264613/2-A
Matrix: Water
Analysis Batch: 264659

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 264613

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0915		mg/L		92	90 - 110

Lab Sample ID: 180-38923-1 MS
Matrix: Water
Analysis Batch: 264659

Client Sample ID: OC-FRAC 5- 111314
Prep Type: Total/NA
Prep Batch: 264613

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0788		mg/L		79	75 - 125

Method: 420.4 - Phenolics, Total Recoverable (Continued)

Lab Sample ID: 180-38923-1 MSD — **Client Sample ID: OC-FRAC 5- 111314**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264659 — **Prep Batch: 264613**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0883		mg/L		88	75 - 125	11	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-264556/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264556

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/17/14 11:30	1

Lab Sample ID: LCS 500-264556/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264556

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	185		mg/L		92	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-264332/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264332

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/14/14 10:25	1

Lab Sample ID: 180-38923-1 DU — **Client Sample ID: OC-FRAC 5- 111314**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264332

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND		ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38923-1

GC/MS Semi VOA

Prep Batch: 125158

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	3520C	
LCS 180-125158/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-125158/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-125158/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 125342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	8270C LL	125158
LCS 180-125158/2-A	Lab Control Sample	Total/NA	Water	8270C LL	125158
LCSD 180-125158/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	125158
MB 180-125158/1-A	Method Blank	Total/NA	Water	8270C LL	125158

HPLC/IC

Analysis Batch: 125098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	300.0	
180-38923-1 MS	OC-FRAC 5- 111314	Total/NA	Water	300.0	
180-38923-1 MSD	OC-FRAC 5- 111314	Total/NA	Water	300.0	
LCS 180-125098/49	Lab Control Sample	Total/NA	Water	300.0	
MB 180-125098/50	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 125306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total Recoverable	Water	200.7	
180-38923-1 MS	OC-FRAC 5- 111314	Total Recoverable	Water	200.7	
180-38923-1 MSD	OC-FRAC 5- 111314	Total Recoverable	Water	200.7	
LCS 180-125306/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-125306/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 125428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total Recoverable	Water	200.7 Rev 4.4	125306
180-38923-1 MS	OC-FRAC 5- 111314	Total Recoverable	Water	200.7 Rev 4.4	125306
180-38923-1 MSD	OC-FRAC 5- 111314	Total Recoverable	Water	200.7 Rev 4.4	125306
LCS 180-125306/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	125306
MB 180-125306/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	125306

General Chemistry

Analysis Batch: 264332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	SM 4500 Cl F	
180-38923-1 DU	OC-FRAC 5- 111314	Total/NA	Water	SM 4500 Cl F	
MB 500-264332/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 264556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	SM 2540D	
LCS 500-264556/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-264556/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 264613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	Distill/Phenol	
180-38923-1 MS	OC-FRAC 5- 111314	Total/NA	Water	Distill/Phenol	
180-38923-1 MSD	OC-FRAC 5- 111314	Total/NA	Water	Distill/Phenol	
LCS 500-264613/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-264613/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 264659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38923-1	OC-FRAC 5- 111314	Total/NA	Water	420.4	264613
180-38923-1 MS	OC-FRAC 5- 111314	Total/NA	Water	420.4	264613
180-38923-1 MSD	OC-FRAC 5- 111314	Total/NA	Water	420.4	264613
LCS 500-264613/2-A	Lab Control Sample	Total/NA	Water	420.4	264613
MB 500-264613/1-A	Method Blank	Total/NA	Water	420.4	264613

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody

180-38923 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testame	Page: Page 1 of 1
Company: Olin Corporation		Analysis Requested	
Address: 51 Eames street	Due Date Requested:		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids
			Preservation Code:				N	N	N	D	S	N	N
FRAC 5 · 111314	11-13-14	1100	G	Water			X		X	X	X	X	X
				Water									

4500 - Cl Mercuric
300.0
8270 - 11
WENT TO Pittsburgh

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	L Johnson	11-13-14 1330	Olin		11/13/14 1330	TA
2				Jc Lilla Watson	11-14-14 9:25	TA
3						

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temp. (s) °C and Other Remarks:

11/19/2014

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Gulchard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation		180-38923 COC	Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: begulchard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	D	S	N	N	X	
FRAC 5 · 111314	11·13·14	1100	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 11·13·14 1332	Company: Olin	Received by:	Date/Time: 11/13/14 1332	Company: TAL
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time: 11/14/14 1015	Company: TAL
Relinquished by	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38923-1

Login Number: 38923

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-38949-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
11/19/2014 2:18:39 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Job ID: 180-38949-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-38949-1

Receipt
The sample was received on 11/15/2014 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.1º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch # 125350.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-38949-1	FRAC 4-111414	Water	11/14/14 10:30	11/15/14 09:15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Client Sample ID: FRAC 4-111414
Date Collected: 11/14/14 10:30
Date Received: 11/15/14 09:15

Lab Sample ID: 180-38949-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	125350	11/17/14 09:00	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	125501	11/18/14 14:10	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		125272	11/15/14 18:22	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	125306	11/17/14 05:24	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	125428	11/17/14 14:13	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	103 mL	264613	11/17/14 14:45	BAH	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	103 mL	264659	11/17/14 16:00	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	264556		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	11/17/14 11:52		
							(End)	11/17/14 11:54		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	264428	11/16/14 13:31	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

BAH = Bridget House

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

JPM = Jeremy Merriman

SLB = Sandy Becker

Batch Type: Analysis

CMR = Carl Reagle

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Client Sample ID: FRAC 4-111414
Date Collected: 11/14/14 10:30
Date Received: 11/15/14 09:15

Lab Sample ID: 180-38949-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/17/14 09:00	11/18/14 14:10	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		11/17/14 09:00	11/18/14 14:10	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/17/14 09:00	11/18/14 14:10	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/17/14 09:00	11/18/14 14:10	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/17/14 09:00	11/18/14 14:10	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/17/14 09:00	11/18/14 14:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*53*		*16 - 122*	*11/17/14 09:00*	*11/18/14 14:10*	*1*
2-Fluorobiphenyl	*53*		*19 - 107*	*11/17/14 09:00*	*11/18/14 14:10*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 111*	*11/17/14 09:00*	*11/18/14 14:10*	*1*
Nitrobenzene-d5 (Surr)	*56*		*23 - 112*	*11/17/14 09:00*	*11/18/14 14:10*	*1*
Phenol-d5 (Surr)	*57*		*15 - 112*	*11/17/14 09:00*	*11/18/14 14:10*	*1*
Terphenyl-d14	*59*		*10 - 132*	*11/17/14 09:00*	*11/18/14 14:10*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**		5.0	0.98	mg/L			11/15/14 18:22	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/17/14 05:24	11/17/14 14:13	1
Iron	ND		50	9.5	ug/L		11/17/14 05:24	11/17/14 14:13	1
Nickel	**0.68**	**J**	10	0.51	ug/L		11/17/14 05:24	11/17/14 14:13	1
Zinc	**9.4**	**J**	10	1.0	ug/L		11/17/14 05:24	11/17/14 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		11/17/14 14:45	11/17/14 16:00	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/17/14 11:52	1
Chlorine, Total Residual	ND	H	0.20	0.20	mg/L			11/16/14 13:31	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-125350/1-A
Matrix: Water
Analysis Batch: 125501

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 125350

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/17/14 09:00	11/18/14 11:54	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/17/14 09:00	11/18/14 11:54	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/17/14 09:00	11/18/14 11:54	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/17/14 09:00	11/18/14 11:54	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/17/14 09:00	11/18/14 11:54	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/17/14 09:00	11/18/14 11:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*16 - 122*	*11/17/14 09:00*	*11/18/14 11:54*	*1*
2-Fluorobiphenyl	*58*		*19 - 107*	*11/17/14 09:00*	*11/18/14 11:54*	*1*
2-Fluorophenol (Surr)	*56*		*10 - 111*	*11/17/14 09:00*	*11/18/14 11:54*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*11/17/14 09:00*	*11/18/14 11:54*	*1*
Phenol-d5 (Surr)	*62*		*15 - 112*	*11/17/14 09:00*	*11/18/14 11:54*	*1*
Terphenyl-d14	*67*		*10 - 132*	*11/17/14 09:00*	*11/18/14 11:54*	*1*

Lab Sample ID: LCS 180-125350/2-A
Matrix: Water
Analysis Batch: 125501

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 125350

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	17.8		ug/L		89	20 - 116
Butyl benzyl phthalate	20.0	17.9		ug/L		90	36 - 108
Di-n-butyl phthalate	20.0	16.3		ug/L		81	37 - 111
Diethyl phthalate	20.0	14.6		ug/L		73	36 - 109
Dimethyl phthalate	20.0	15.6		ug/L		78	37 - 106
Di-n-octyl phthalate	20.0	18.1		ug/L		90	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*74*		*16 - 122*
2-Fluorobiphenyl	*71*		*19 - 107*
2-Fluorophenol (Surr)	*75*		*10 - 111*
Nitrobenzene-d5 (Surr)	*75*		*23 - 112*
Phenol-d5 (Surr)	*83*		*15 - 112*
Terphenyl-d14	*77*		*10 - 132*

Lab Sample ID: LCSD 180-125350/3-A
Matrix: Water
Analysis Batch: 125501

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125350

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	18.2		ug/L		91	20 - 116	2	40
Butyl benzyl phthalate	20.0	18.0		ug/L		90	36 - 108	0	40
Di-n-butyl phthalate	20.0	16.2		ug/L		81	37 - 111	0	38
Diethyl phthalate	20.0	14.8		ug/L		74	36 - 109	2	39
Dimethyl phthalate	20.0	16.0		ug/L		80	37 - 106	2	42
Di-n-octyl phthalate	20.0	18.2		ug/L		91	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-125350/3-A
Matrix: Water
Analysis Batch: 125501

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125350

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*
2-Fluorobiphenyl	*73*		*19 - 107*
2-Fluorophenol (Surr)	*76*		*10 - 111*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*
Phenol-d5 (Surr)	*83*		*15 - 112*
Terphenyl-d14	*78*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-125272/6
Matrix: Water
Analysis Batch: 125272

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			11/15/14 11:49	1

Lab Sample ID: LCS 180-125272/5
Matrix: Water
Analysis Batch: 125272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.8		mg/L		100	90 - 110

Lab Sample ID: 180-38949-1 MS
Matrix: Water
Analysis Batch: 125272

Client Sample ID: FRAC 4-111414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	210		125	326		mg/L		97	80 - 120

Lab Sample ID: 180-38949-1 MSD
Matrix: Water
Analysis Batch: 125272

Client Sample ID: FRAC 4-111414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	210		125	326		mg/L		97	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-125306/1-A
Matrix: Water
Analysis Batch: 125428

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/17/14 05:24	11/17/14 13:43	1
Iron	ND		50	9.5	ug/L		11/17/14 05:24	11/17/14 13:43	1
Nickel	ND		10	0.51	ug/L		11/17/14 05:24	11/17/14 13:43	1
Zinc	ND		10	1.0	ug/L		11/17/14 05:24	11/17/14 13:43	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-125306/2-A
Matrix: Water
Analysis Batch: 125428

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 125306

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	540		ug/L		108	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	512		ug/L		102	85 - 115
Zinc	500	521		ug/L		104	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-264613/1-A
Matrix: Water
Analysis Batch: 264659

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 264613

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/17/14 14:45	11/17/14 15:51	1

Lab Sample ID: LCS 500-264613/2-A
Matrix: Water
Analysis Batch: 264659

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 264613

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0915		mg/L		92	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-264556/1
Matrix: Water
Analysis Batch: 264556

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/17/14 11:30	1

Lab Sample ID: LCS 500-264556/2
Matrix: Water
Analysis Batch: 264556

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	185		mg/L		92	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-264428/1
Matrix: Water
Analysis Batch: 264428

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/16/14 13:30	1

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

Method: SM 4500 Cl F - Chlorine, Residual (Continued)

Lab Sample ID: 180-38949-1 DU
Matrix: Water
Analysis Batch: 264428

Client Sample ID: FRAC 4-111414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	H		ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-38949-1

GC/MS Semi VOA

Prep Batch: 125350

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	3520C	
LCS 180-125350/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-125350/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-125350/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 125501

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	8270C LL	125350
LCS 180-125350/2-A	Lab Control Sample	Total/NA	Water	8270C LL	125350
LCSD 180-125350/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	125350
MB 180-125350/1-A	Method Blank	Total/NA	Water	8270C LL	125350

HPLC/IC

Analysis Batch: 125272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	300.0	
180-38949-1 MS	FRAC 4-111414	Total/NA	Water	300.0	
180-38949-1 MSD	FRAC 4-111414	Total/NA	Water	300.0	
LCS 180-125272/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-125272/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 125306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total Recoverable	Water	200.7	
LCS 180-125306/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-125306/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 125428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total Recoverable	Water	200.7 Rev 4.4	125306
LCS 180-125306/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	125306
MB 180-125306/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	125306

General Chemistry

Analysis Batch: 264428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	SM 4500 Cl F	
180-38949-1 DU	FRAC 4-111414	Total/NA	Water	SM 4500 Cl F	
MB 500-264428/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 264556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	SM 2540D	
LCS 500-264556/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-264556/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 264613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	Distill/Phenol	
LCS 500-264613/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-264613/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 264659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-38949-1	FRAC 4-111414	Total/NA	Water	420.4	264613
LCS 500-264613/2-A	Lab Control Sample	Total/NA	Water	420.4	264613
MB 500-264613/1-A	Method Blank	Total/NA	Water	420.4	264613

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

11/19/2014

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Analysis Requested

180-38949 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_E - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 4- 111414	11-14-14	1030	G	Water			X		X	X	X	X	X		
				Water											

1 - Ice
J - DI Water
K - EDTA
L - EDA
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by: L Johnson	Date/Time: 11-14-14	Company	Received by:	Date/Time: 11/14/14 14:30	Company TA
Relinquished by:	Date/Time: 11/14/14 16:30	Company TA	Received by: DeMue Watson	Date/Time: 11-15-14 9:15	Company TA
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information
Client Contact: Mr. Brian Gulchard
Company: Olin Corporation
Address: 51 Eames street
City: Wilmington
State, Zip: MA, 01887
Phone: 978 658 6121
Email: begulchard@olin.com
Project Name: Wilmington Plant B RPG
Site: WILMINGTON MA

180-38949 COC

Sampler: L Johnson
Phone: 978 658 6121
Lab PM: Mason, Becky C
E-Mail: becky.mason@testamericainc.com
Carrier Tracking No(s):
COC No: 480-41314-10069.1
Page: Page 1 of 1
Job #: 180-38949

Due Date Requested:
TAT Requested (days): A.S.A.P.
PO #: REWI0020
WO #:
Project #: 48006863
SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	Sample Type	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 4- 111414	11.14.14	1030	G	Water			X		X	X	X	X	X		
				Water											

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)
Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	11.14.14			11/14/14 14:30	TA
2		11/14/14 16:30	TA		11/15/14 1025	TA-CHT
3						

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 3.3

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38949-1

Login Number: 38949

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-38949-1

Login Number: 38949

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-39051-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/24/2014 11:57:21 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Job ID: 180-39051-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 11/19/2014 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.9º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 125695. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Client Sample ID: FRAC 1-111814 **Lab Sample ID: 180-39051-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.39	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.15	J	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	240	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	0.0025	J	0.010	0.0024	mg/L	1		200.7 Rev 4.4	Total/NA
Zinc	0.014	J B	0.020	0.0037	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FRAC 1-111814
Date Collected: 11/18/14 10:00
Date Received: 11/19/14 09:30

Lab Sample ID: 180-39051-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/19/14 11:53	11/20/14 15:01	1
Butyl benzyl phthalate	**0.39**	**J**	0.94	0.13	ug/L		11/19/14 11:53	11/20/14 15:01	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/19/14 11:53	11/20/14 15:01	1
Diethyl phthalate	**0.15**	**J**	0.94	0.14	ug/L		11/19/14 11:53	11/20/14 15:01	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/19/14 11:53	11/20/14 15:01	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/19/14 11:53	11/20/14 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*	*11/19/14 11:53*	*11/20/14 15:01*	*1*
2-Fluorobiphenyl	*66*		*19 - 107*	*11/19/14 11:53*	*11/20/14 15:01*	*1*
2-Fluorophenol (Surr)	*58*		*10 - 111*	*11/19/14 11:53*	*11/20/14 15:01*	*1*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*	*11/19/14 11:53*	*11/20/14 15:01*	*1*
Phenol-d5 (Surr)	*66*		*15 - 112*	*11/19/14 11:53*	*11/20/14 15:01*	*1*
Terphenyl-d14	*73*		*10 - 132*	*11/19/14 11:53*	*11/20/14 15:01*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**	**B**	5.0	0.98	mg/L			11/19/14 12:07	5

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.20	0.086	mg/L		11/21/14 09:30	11/21/14 17:20	1
Nickel	ND		0.010	0.0012	mg/L		11/21/14 09:30	11/21/14 17:20	1
Arsenic	**0.0025**	**J**	0.010	0.0024	mg/L		11/21/14 09:30	11/21/14 17:20	1
Zinc	**0.014**	**J B**	0.020	0.0037	mg/L		11/21/14 09:30	11/21/14 17:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		11/20/14 12:06	11/20/14 16:45	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/20/14 14:29	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/19/14 11:46	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39051-1	FRAC 1-111814	68	66	58	64	66	73		
LCS 180-125695/2-A	Lab Control Sample	62	61	67	64	68	60		
LCSD 180-125695/3-A	Lab Control Sample Dup	65	63	68	65	69	60		
MB 180-125695/1-A	Method Blank	61	64	66	65	71	62		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-125695/1-A
Matrix: Water
Analysis Batch: 125799

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 125695

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/19/14 11:53	11/20/14 12:43	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/19/14 11:53	11/20/14 12:43	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/19/14 11:53	11/20/14 12:43	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/19/14 11:53	11/20/14 12:43	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/19/14 11:53	11/20/14 12:43	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/19/14 11:53	11/20/14 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*16 - 122*	*11/19/14 11:53*	*11/20/14 12:43*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*11/19/14 11:53*	*11/20/14 12:43*	*1*
2-Fluorophenol (Surr)	*66*		*10 - 111*	*11/19/14 11:53*	*11/20/14 12:43*	*1*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*	*11/19/14 11:53*	*11/20/14 12:43*	*1*
Phenol-d5 (Surr)	*71*		*15 - 112*	*11/19/14 11:53*	*11/20/14 12:43*	*1*
Terphenyl-d14	*62*		*10 - 132*	*11/19/14 11:53*	*11/20/14 12:43*	*1*

Lab Sample ID: LCS 180-125695/2-A
Matrix: Water
Analysis Batch: 125799

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 125695

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.1		ug/L		70	20 - 116
Butyl benzyl phthalate	20.0	14.2		ug/L		71	36 - 108
Di-n-butyl phthalate	20.0	12.3		ug/L		62	37 - 111
Diethyl phthalate	20.0	10.7		ug/L		54	36 - 109
Dimethyl phthalate	20.0	11.8		ug/L		59	37 - 106
Di-n-octyl phthalate	20.0	13.9		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*62*		*16 - 122*
2-Fluorobiphenyl	*61*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*
Phenol-d5 (Surr)	*68*		*15 - 112*
Terphenyl-d14	*60*		*10 - 132*

Lab Sample ID: LCSD 180-125695/3-A
Matrix: Water
Analysis Batch: 125799

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125695

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.3		ug/L		72	20 - 116	2	40
Butyl benzyl phthalate	20.0	14.4		ug/L		72	36 - 108	1	40
Di-n-butyl phthalate	20.0	12.6		ug/L		63	37 - 111	2	38
Diethyl phthalate	20.0	11.0		ug/L		55	36 - 109	2	39
Dimethyl phthalate	20.0	12.1		ug/L		61	37 - 106	3	42
Di-n-octyl phthalate	20.0	14.5		ug/L		72	11 - 127	4	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-125695/3-A
Matrix: Water
Analysis Batch: 125799

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 125695

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*
2-Fluorobiphenyl	*63*		*19 - 107*
2-Fluorophenol (Surr)	*68*		*10 - 111*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*60*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-125621/6
Matrix: Water
Analysis Batch: 125621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.295	J	1.0	0.20	mg/L			11/19/14 08:22	1

Lab Sample ID: LCS 180-125621/5
Matrix: Water
Analysis Batch: 125621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.5		mg/L		97	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 500-265395/1-A
Matrix: Water
Analysis Batch: 265513

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 265395

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.157	J	0.20	0.086	mg/L		11/21/14 09:30	11/21/14 17:07	1
Nickel	ND		0.010	0.0012	mg/L		11/21/14 09:30	11/21/14 17:07	1
Arsenic	ND		0.010	0.0024	mg/L		11/21/14 09:30	11/21/14 17:07	1
Zinc	0.00769	J	0.020	0.0037	mg/L		11/21/14 09:30	11/21/14 17:07	1

Lab Sample ID: LCS 500-265395/2-A
Matrix: Water
Analysis Batch: 265513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 265395

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	1.00	0.954		mg/L		95	85 - 115
Nickel	0.500	0.474		mg/L		95	85 - 115
Arsenic	0.100	0.0993		mg/L		99	85 - 115
Zinc	0.500	0.492		mg/L		98	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-265207/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265351 — **Prep Batch: 265207**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/20/14 12:06	11/20/14 16:43	1

Lab Sample ID: LCS 500-265207/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265351 — **Prep Batch: 265207**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0949		mg/L		95	90 - 110

Lab Sample ID: 180-39051-1 MS — **Client Sample ID: FRAC 1-111814**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265351 — **Prep Batch: 265207**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0968		mg/L		97	75 - 125

Lab Sample ID: 180-39051-1 MSD — **Client Sample ID: FRAC 1-111814**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265351 — **Prep Batch: 265207**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0976		mg/L		98	75 - 125	1	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-265252/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265252

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/20/14 14:25	1

Lab Sample ID: LCS 500-265252/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265252

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	174		mg/L		87	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-264993/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 264993

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/19/14 11:45	1

Method: SM 4500 Cl F - Chlorine, Residual (Continued)

Lab Sample ID: 180-39051-1 DU
Matrix: Water
Analysis Batch: 264993

Client Sample ID: FRAC 1-111814
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND			ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 125695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	3520C	
LCS 180-125695/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-125695/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-125695/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 125799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	8270C LL	125695
LCS 180-125695/2-A	Lab Control Sample	Total/NA	Water	8270C LL	125695
LCSD 180-125695/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	125695
MB 180-125695/1-A	Method Blank	Total/NA	Water	8270C LL	125695

HPLC/IC

Analysis Batch: 125621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	300.0	
LCS 180-125621/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-125621/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 265395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	200.7	
LCS 500-265395/2-A	Lab Control Sample	Total/NA	Water	200.7	
MB 500-265395/1-A	Method Blank	Total/NA	Water	200.7	

Analysis Batch: 265513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	200.7 Rev 4.4	265395
LCS 500-265395/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	265395
MB 500-265395/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	265395

General Chemistry

Analysis Batch: 264993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	SM 4500 Cl F	
180-39051-1 DU	FRAC 1-111814	Total/NA	Water	SM 4500 Cl F	
MB 500-264993/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 265207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	Distill/Phenol	
180-39051-1 MS	FRAC 1-111814	Total/NA	Water	Distill/Phenol	
180-39051-1 MSD	FRAC 1-111814	Total/NA	Water	Distill/Phenol	
LCS 500-265207/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-265207/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Analysis Batch: 265252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	SM 2540D	
LCS 500-265252/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-265252/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 265351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39051-1	FRAC 1-111814	Total/NA	Water	420.4	265207
180-39051-1 MS	FRAC 1-111814	Total/NA	Water	420.4	265207
180-39051-1 MSD	FRAC 1-111814	Total/NA	Water	420.4	265207
LCS 500-265207/2-A	Lab Control Sample	Total/NA	Water	420.4	265207
MB 500-265207/1-A	Method Blank	Total/NA	Water	420.4	265207

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Client Sample ID: FRAC 1-111814
Date Collected: 11/18/14 10:00
Date Received: 11/19/14 09:30

Lab Sample ID: 180-39051-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	125695	11/19/14 11:53	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	125799	11/20/14 15:01	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		125621	11/19/14 12:07	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Prep	200.7			50 mL	50 mL	265395	11/21/14 09:30	MJP	TAL CHI
Total/NA	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	265513	11/21/14 17:20	KML	TAL CHI
	Instrument ID: ICP5									
Total/NA	Prep	Distill/Phenol			100 mL	102 mL	265207	11/20/14 12:06	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	102 mL	265351	11/20/14 16:45	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	265252		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	11/20/14 14:29		
							(End)	11/20/14 14:31		
Total/NA	Analysis	SM 4500 Cl F		1			264993	11/19/14 11:46	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

MJP = Michael Peters

Batch Type: Analysis

AJR = Andrew Raebig

KML = Keith Lacy

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL CHI
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39051-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39051-1	FRAC 1-111814	Water	11/18/14 10:00	11/19/14 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

180-39051 Chain of Custody

G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
Frac 1 - 111814	11-18-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Analysis Re

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	11-18-14			11-18-14 1100	TA
2		11-18-14 1630	TA		11/19/14 9:15	TAP
3		Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39051-1

Login Number: 39051

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39051-1

Login Number: 39051

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 11/29/15

TestAmerica Job ID: 180-39204-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
11/28/2014 12:40:03 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Job ID: 180-39204-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-39204-1

Receipt
The sample was received on 11/22/2014 10:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 126194. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39204-1	OC-INF 112114	Water	11/21/14 08:00	11/22/14 10:15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

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TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Client Sample ID: OC-INF 112114
Date Collected: 11/21/14 08:00
Date Received: 11/22/14 10:15

Lab Sample ID: 180-39204-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	126194	11/24/14 08:00	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	126552	11/26/14 15:44	VVP	TAL PIT
		Instrument ID: CH731								
Total/NA	Analysis	300.0		5	1 mL		126067	11/22/14 18:51	MJH	TAL PIT
		Instrument ID: CHICS2000								
Total Recoverable	Prep	200.7			50 mL	50 mL	126343	11/25/14 06:23	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	126498	11/25/14 15:11	RJG	TAL PIT
		Instrument ID: C								
Total/NA	Prep	Distill/Phenol			100 mL	103 mL	265921	11/25/14 13:37	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	103 mL	265963	11/25/14 15:48	AJR	TAL CHI
		Instrument ID: SEAL2								
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	265708		MTB	TAL CHI
		Instrument ID: NOEQUIP						(Start) 11/24/14 11:45		
								(End) 11/24/14 11:47		
Total/NA	Analysis	SM 4500 Cl F		1			265529	11/22/14 12:46	EAT	TAL CHI
		Instrument ID: NOEQUIP								

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

EAT = Eliane Treadwell

MTB = Mary Brogan

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Client Sample ID: OC-INF 112114
Date Collected: 11/21/14 08:00
Date Received: 11/22/14 10:15

Lab Sample ID: 180-39204-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**4.5**		1.9	1.2	ug/L		11/24/14 08:00	11/26/14 15:44	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		11/24/14 08:00	11/26/14 15:44	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/24/14 08:00	11/26/14 15:44	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/24/14 08:00	11/26/14 15:44	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/24/14 08:00	11/26/14 15:44	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/24/14 08:00	11/26/14 15:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*11/24/14 08:00*	*11/26/14 15:44*	*1*
2-Fluorobiphenyl	*49*		*19 - 107*	*11/24/14 08:00*	*11/26/14 15:44*	*1*
2-Fluorophenol (Surr)	*46*		*10 - 111*	*11/24/14 08:00*	*11/26/14 15:44*	*1*
Nitrobenzene-d5 (Surr)	*55*		*23 - 112*	*11/24/14 08:00*	*11/26/14 15:44*	*1*
Phenol-d5 (Surr)	*43*		*15 - 112*	*11/24/14 08:00*	*11/26/14 15:44*	*1*
Terphenyl-d14	*27*		*10 - 132*	*11/24/14 08:00*	*11/26/14 15:44*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**250**	**B**	5.0	0.98	mg/L			11/22/14 18:51	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**12**		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:11	1
Iron	**7000**		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:11	1
Nickel	**1.1**	**J**	10	0.51	ug/L		11/25/14 06:23	11/25/14 15:11	1
Zinc	**3.5**	**J**	10	1.0	ug/L		11/25/14 06:23	11/25/14 15:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0049**	**J**	0.0052	0.0023	mg/L		11/25/14 13:37	11/25/14 15:48	1
Total Suspended Solids	**8.0**		5.0	1.6	mg/L			11/24/14 11:45	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/22/14 12:46	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-126194/1-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 126194

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/24/14 08:00	11/25/14 11:09	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/24/14 08:00	11/25/14 11:09	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/24/14 08:00	11/25/14 11:09	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/24/14 08:00	11/25/14 11:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*58*		*16 - 122*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorobiphenyl	*60*		*19 - 107*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorophenol (Surr)	*63*		*10 - 111*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Terphenyl-d14	*60*		*10 - 132*	*11/24/14 08:00*	*11/25/14 11:09*	*1*

Lab Sample ID: LCS 180-126194/2-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.7		ug/L		69	20 - 116
Butyl benzyl phthalate	20.0	13.1		ug/L		65	36 - 108
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.8		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.7		ug/L		69	37 - 106
Di-n-octyl phthalate	20.0	13.9		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*60*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*
Phenol-d5 (Surr)	*59*		*15 - 112*
Terphenyl-d14	*65*		*10 - 132*

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	13.5		ug/L		68	20 - 116	2	40
Butyl benzyl phthalate	20.0	13.0		ug/L		65	36 - 108	1	40
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111	0	38
Diethyl phthalate	20.0	13.2		ug/L		66	36 - 109	5	39
Dimethyl phthalate	20.0	12.9		ug/L		64	37 - 106	6	42
Di-n-octyl phthalate	20.0	13.6		ug/L		68	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*
2-Fluorobiphenyl	*58*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*57*		*23 - 112*
Phenol-d5 (Surr)	*58*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-126067/6
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.326	J	1.0	0.20	mg/L			11/22/14 09:23	1

Lab Sample ID: LCS 180-126067/5
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.8		mg/L		96	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-126343/1-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:01	1
Iron	ND		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:01	1
Nickel	ND		10	0.51	ug/L		11/25/14 06:23	11/25/14 15:01	1
Zinc	ND		10	1.0	ug/L		11/25/14 06:23	11/25/14 15:01	1

Lab Sample ID: LCS 180-126343/2-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	502		ug/L		100	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-39204-1 MS
Matrix: Water
Analysis Batch: 126498

Client Sample ID: OC-INF 112114
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	12		500	538		ug/L		105	70 - 130
Iron	7000		1000	8100	4	ug/L		110	70 - 130
Nickel	1.1	J	500	507		ug/L		101	70 - 130
Zinc	3.5	J	500	496		ug/L		98	70 - 130

Lab Sample ID: 180-39204-1 MSD
Matrix: Water
Analysis Batch: 126498

Client Sample ID: OC-INF 112114
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	12		500	540		ug/L		106	70 - 130	0	20
Iron	7000		1000	8060	4	ug/L		106	70 - 130	1	20
Nickel	1.1	J	500	510		ug/L		102	70 - 130	1	20
Zinc	3.5	J	500	499		ug/L		99	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-265921/1-A
Matrix: Water
Analysis Batch: 265963

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 265921

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/25/14 13:37	11/25/14 15:35	1

Lab Sample ID: LCS 500-265921/2-A
Matrix: Water
Analysis Batch: 265963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 265921

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.100		mg/L		100	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-265708/1
Matrix: Water
Analysis Batch: 265708

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/24/14 11:15	1

Lab Sample ID: LCS 500-265708/2
Matrix: Water
Analysis Batch: 265708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	223		mg/L		111	80 - 120

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-265529/1
Matrix: Water
Analysis Batch: 265529

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/22/14 12:40	1

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

GC/MS Semi VOA

Prep Batch: 126194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	3520C	
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-126194/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 126361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	8270C LL	126194
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	126194
MB 180-126194/1-A	Method Blank	Total/NA	Water	8270C LL	126194

Analysis Batch: 126552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	8270C LL	126194

HPLC/IC

Analysis Batch: 126067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	300.0	
LCS 180-126067/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-126067/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 126343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total Recoverable	Water	200.7	
180-39204-1 MS	OC-INF 112114	Total Recoverable	Water	200.7	
180-39204-1 MSD	OC-INF 112114	Total Recoverable	Water	200.7	
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 126498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total Recoverable	Water	200.7 Rev 4.4	126343
180-39204-1 MS	OC-INF 112114	Total Recoverable	Water	200.7 Rev 4.4	126343
180-39204-1 MSD	OC-INF 112114	Total Recoverable	Water	200.7 Rev 4.4	126343
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	126343
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	126343

General Chemistry

Analysis Batch: 265529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	SM 4500 Cl F	
MB 500-265529/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39204-1

General Chemistry (Continued)

Analysis Batch: 265708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	SM 2540D	
LCS 500-265708/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-265708/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 265921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	Distill/Phenol	
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-265921/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 265963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39204-1	OC-INF 112114	Total/NA	Water	420.4	265921
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	420.4	265921
MB 500-265921/1-A	Method Blank	Total/NA	Water	420.4	265921

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-39204 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericai		of 1
Company: Olin Corporation				
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Preservation Codes: B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2SO3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - ph 4-5; Z - other (specify); Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	S	N	N		
INF 112114	11-21-14	0800	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: L Johnson	Date/Time: 11-21-14	Company	Received by:	Date/Time: 11-21-14 1100	Company
Relinquished by:	Date/Time: 11-21-14 1700	Company	Received by: Bonnie Watson	Date/Time: 11-22-14	Company AP
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 10:15	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

11/28/2014

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-39204 COC

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Gulchard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887			
Phone: 978.658.6121	PO #: REWI0020		Other:
Email: begulchard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
INF 112114	11.21.14	0800	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	L Johnson	11.21.14			11-21-14 1100	TA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		11-21-14 1700			11/22/14 1010	TAL
	Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: -0.8

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39204-1

Login Number: 39204

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39204-1

Login Number: 39204

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39205-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
11/28/2014 1:03:59 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-39205-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-39205-1

Receipt
The sample was received on 11/22/2014 10:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 126194. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39205-1

Client Sample ID: OC-FRAC3 112114

Lab Sample ID: 180-39205-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.14	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	210	B	5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	0.63	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	11		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.012		0.0051	0.0022	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC3 112114
Date Collected: 11/21/14 10:00
Date Received: 11/22/14 10:15

Lab Sample ID: 180-39205-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/24/14 08:00	11/25/14 19:53	1
Butyl benzyl phthalate	**0.14**	**J**	0.94	0.13	ug/L		11/24/14 08:00	11/25/14 19:53	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/24/14 08:00	11/25/14 19:53	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/24/14 08:00	11/25/14 19:53	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/24/14 08:00	11/25/14 19:53	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/24/14 08:00	11/25/14 19:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*	*11/24/14 08:00*	*11/25/14 19:53*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*11/24/14 08:00*	*11/25/14 19:53*	*1*
2-Fluorophenol (Surr)	*65*		*10 - 111*	*11/24/14 08:00*	*11/25/14 19:53*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*	*11/24/14 08:00*	*11/25/14 19:53*	*1*
Phenol-d5 (Surr)	*66*		*15 - 112*	*11/24/14 08:00*	*11/25/14 19:53*	*1*
Terphenyl-d14	*75*		*10 - 132*	*11/24/14 08:00*	*11/25/14 19:53*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**	**B**	5.0	0.98	mg/L			11/22/14 23:03	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:31	1
Iron	ND		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:31	1
Nickel	**0.63**	**J**	10	0.51	ug/L		11/25/14 06:23	11/25/14 15:31	1
Zinc	**11**		10	1.0	ug/L		11/25/14 06:23	11/25/14 15:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.012**		0.0051	0.0022	mg/L		11/25/14 13:37	11/25/14 15:49	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/24/14 11:47	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/22/14 12:48	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39205-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39205-1	OC-FRAC3 112114	70	64	65	69	66	75		
LCS 180-126194/2-A	Lab Control Sample	68	60	58	59	59	65		
LCSD 180-126194/3-A	Lab Control Sample Dup	65	58	58	57	58	63		
MB 180-126194/1-A	Method Blank	58	60	63	61	63	60		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-126194/1-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 126194

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/24/14 08:00	11/25/14 11:09	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/24/14 08:00	11/25/14 11:09	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/24/14 08:00	11/25/14 11:09	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/24/14 08:00	11/25/14 11:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*58*		*16 - 122*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorobiphenyl	*60*		*19 - 107*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorophenol (Surr)	*63*		*10 - 111*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Terphenyl-d14	*60*		*10 - 132*	*11/24/14 08:00*	*11/25/14 11:09*	*1*

Lab Sample ID: LCS 180-126194/2-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.7		ug/L		69	20 - 116
Butyl benzyl phthalate	20.0	13.1		ug/L		65	36 - 108
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.8		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.7		ug/L		69	37 - 106
Di-n-octyl phthalate	20.0	13.9		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*60*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*
Phenol-d5 (Surr)	*59*		*15 - 112*
Terphenyl-d14	*65*		*10 - 132*

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	13.5		ug/L		68	20 - 116	2	40
Butyl benzyl phthalate	20.0	13.0		ug/L		65	36 - 108	1	40
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111	0	38
Diethyl phthalate	20.0	13.2		ug/L		66	36 - 109	5	39
Dimethyl phthalate	20.0	12.9		ug/L		64	37 - 106	6	42
Di-n-octyl phthalate	20.0	13.6		ug/L		68	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*
2-Fluorobiphenyl	*58*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*57*		*23 - 112*
Phenol-d5 (Surr)	*58*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-126067/6
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.326	J	1.0	0.20	mg/L			11/22/14 09:23	1

Lab Sample ID: LCS 180-126067/5
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.8		mg/L		96	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-126343/1-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:01	1
Iron	ND		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:01	1
Nickel	ND		10	0.51	ug/L		11/25/14 06:23	11/25/14 15:01	1
Zinc	ND		10	1.0	ug/L		11/25/14 06:23	11/25/14 15:01	1

Lab Sample ID: LCS 180-126343/2-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	502		ug/L		100	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-265921/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265963 — **Prep Batch: 265921**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/25/14 13:37	11/25/14 15:35	1

Lab Sample ID: LCS 500-265921/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265963 — **Prep Batch: 265921**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.100		mg/L		100	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-265708/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265708

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/24/14 11:15	1

Lab Sample ID: LCS 500-265708/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265708

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	223		mg/L		111	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-265529/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265529

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/22/14 12:40	1

GC/MS Semi VOA

Prep Batch: 126194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	3520C	
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-126194/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 126361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	8270C LL	126194
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	8270C LL	126194
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	126194
MB 180-126194/1-A	Method Blank	Total/NA	Water	8270C LL	126194

HPLC/IC

Analysis Batch: 126067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	300.0	
LCS 180-126067/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-126067/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 126343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total Recoverable	Water	200.7	
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 126498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total Recoverable	Water	200.7 Rev 4.4	126343
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	126343
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	126343

General Chemistry

Analysis Batch: 265529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	SM 4500 Cl F	
MB 500-265529/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 265708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	SM 2540D	
LCS 500-265708/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-265708/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 265921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 265921 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-265921/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 265963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39205-1	OC-FRAC3 112114	Total/NA	Water	420.4	265921
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	420.4	265921
MB 500-265921/1-A	Method Blank	Total/NA	Water	420.4	265921

Client Sample ID: OC-FRAC3 112114 — **Lab Sample ID: 180-39205-1**
Date Collected: 11/21/14 10:00 — **Matrix: Water**
Date Received: 11/22/14 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	126194	11/24/14 08:00	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	126361	11/25/14 19:53	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		126067	11/22/14 23:03	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	126343	11/25/14 06:23	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	126498	11/25/14 15:31	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	265921	11/25/14 13:37	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	265963	11/25/14 15:49	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	265708		MTB	TAL CHI
	Instrument ID: NOEQUIP						(Start)	11/24/14 11:47		
							(End)	11/24/14 11:48		
Total/NA	Analysis	SM 4500 Cl F		1			265529	11/22/14 12:48	EAT	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

EAT = Eliane Treadwell

MTB = Mary Brogan

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39205-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39205-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39205-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39205-1	OC-FRAC3 112114	Water	11/21/14 10:00	11/22/14 10:15

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-39205 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testam	...ge: ...age 1 of 1
Company: Olin Corporation			...b #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978·658·6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
Frac3 112114	11-21-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	11-21-14		[signature]	11-21-14 1100	
[signature]	11-21-14 1700		[signature]	11-22-14	TAP
				10:15	

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

180-39205 COC

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 460-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978.658.6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	9270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
Frac3 112114	11.21.14	1000	G	Water			X		X	X	X	X	X		
				Water											

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by: L Johnson	Date/Time: 11.21.14	Company	Received by:	Date/Time: 11.21.14 1100	Company
	Relinquished by:	Date/Time: 11.21.14 1700	Company	Received by:	Date/Time: 11/22/14 1010	Company TAL
	Relinquished by	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: -0.8

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39205-1

Login Number: 39205

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39205-1

Login Number: 39205

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-39207-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
11/28/2014 1:09:21 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 180-39207-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-39207-1

Receipt
The sample was received on 11/22/2014 10:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 126194. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39207-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39207-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39207-1	OC-FRAC2-112014	Water	11/20/14 13:30	11/22/14 10:15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39207-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Client Sample ID: OC-FRAC2-112014 — **Lab Sample ID: 180-39207-1**

Date Collected: 11/20/14 13:30 — **Matrix: Water**

Date Received: 11/22/14 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	126194	11/24/14 08:00	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	126361	11/25/14 20:21	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		126067	11/22/14 23:23	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	126343	11/25/14 06:23	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	126498	11/25/14 15:36	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	107 mL	265921	11/25/14 13:37	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	107 mL	265963	11/25/14 15:50	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	265708		MTB	TAL CHI
	Instrument ID: NOEQUIP							(Start) 11/24/14 11:48		
								(End) 11/24/14 11:50		
Total/NA	Analysis	SM 4500 Cl F		1			265529	11/22/14 12:47	EAT	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

EAT = Eliane Treadwell

MTB = Mary Brogan

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Client Sample ID: OC-FRAC2-112014
Date Collected: 11/20/14 13:30
Date Received: 11/22/14 10:15

Lab Sample ID: 180-39207-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/24/14 08:00	11/25/14 20:21	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		11/24/14 08:00	11/25/14 20:21	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/24/14 08:00	11/25/14 20:21	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/24/14 08:00	11/25/14 20:21	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/24/14 08:00	11/25/14 20:21	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/24/14 08:00	11/25/14 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*11/24/14 08:00*	*11/25/14 20:21*	*1*
2-Fluorobiphenyl	*56*		*19 - 107*	*11/24/14 08:00*	*11/25/14 20:21*	*1*
2-Fluorophenol (Surr)	*51*		*10 - 111*	*11/24/14 08:00*	*11/25/14 20:21*	*1*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*	*11/24/14 08:00*	*11/25/14 20:21*	*1*
Phenol-d5 (Surr)	*51*		*15 - 112*	*11/24/14 08:00*	*11/25/14 20:21*	*1*
Terphenyl-d14	*70*		*10 - 132*	*11/24/14 08:00*	*11/25/14 20:21*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**220**	**B**	5.0	0.98	mg/L			11/22/14 23:23	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:36	1
Iron	ND		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:36	1
Nickel	**0.98**	**J**	10	0.51	ug/L		11/25/14 06:23	11/25/14 15:36	1
Zinc	**11**		10	1.0	ug/L		11/25/14 06:23	11/25/14 15:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0024**	**J**	0.0054	0.0024	mg/L		11/25/14 13:37	11/25/14 15:50	1
Total Suspended Solids	ND		5.0	1.6	mg/L			11/24/14 11:48	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			11/22/14 12:47	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-126194/1-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 126194

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/24/14 08:00	11/25/14 11:09	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/24/14 08:00	11/25/14 11:09	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/24/14 08:00	11/25/14 11:09	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/24/14 08:00	11/25/14 11:09	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/24/14 08:00	11/25/14 11:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*58*		*16 - 122*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorobiphenyl	*60*		*19 - 107*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
2-Fluorophenol (Surr)	*63*		*10 - 111*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*11/24/14 08:00*	*11/25/14 11:09*	*1*
Terphenyl-d14	*60*		*10 - 132*	*11/24/14 08:00*	*11/25/14 11:09*	*1*

Lab Sample ID: LCS 180-126194/2-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.7		ug/L		69	20 - 116
Butyl benzyl phthalate	20.0	13.1		ug/L		65	36 - 108
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.8		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.7		ug/L		69	37 - 106
Di-n-octyl phthalate	20.0	13.9		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*60*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*
Phenol-d5 (Surr)	*59*		*15 - 112*
Terphenyl-d14	*65*		*10 - 132*

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	13.5		ug/L		68	20 - 116	2	40
Butyl benzyl phthalate	20.0	13.0		ug/L		65	36 - 108	1	40
Di-n-butyl phthalate	20.0	13.5		ug/L		68	37 - 111	0	38
Diethyl phthalate	20.0	13.2		ug/L		66	36 - 109	5	39
Dimethyl phthalate	20.0	12.9		ug/L		64	37 - 106	6	42
Di-n-octyl phthalate	20.0	13.6		ug/L		68	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-126194/3-A
Matrix: Water
Analysis Batch: 126361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126194

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*
2-Fluorobiphenyl	*58*		*19 - 107*
2-Fluorophenol (Surr)	*58*		*10 - 111*
Nitrobenzene-d5 (Surr)	*57*		*23 - 112*
Phenol-d5 (Surr)	*58*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-126067/6
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.326	J	1.0	0.20	mg/L			11/22/14 09:23	1

Lab Sample ID: LCS 180-126067/5
Matrix: Water
Analysis Batch: 126067

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.8		mg/L		96	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-126343/1-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/25/14 06:23	11/25/14 15:01	1
Iron	ND		50	9.5	ug/L		11/25/14 06:23	11/25/14 15:01	1
Nickel	ND		10	0.51	ug/L		11/25/14 06:23	11/25/14 15:01	1
Zinc	ND		10	1.0	ug/L		11/25/14 06:23	11/25/14 15:01	1

Lab Sample ID: LCS 180-126343/2-A
Matrix: Water
Analysis Batch: 126498

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 126343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	502		ug/L		100	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-265921/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265963 — **Prep Batch: 265921**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/25/14 13:37	11/25/14 15:35	1

Lab Sample ID: LCS 500-265921/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265963 — **Prep Batch: 265921**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.100		mg/L		100	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-265708/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265708

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/24/14 11:15	1

Lab Sample ID: LCS 500-265708/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265708

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	223		mg/L		111	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-265529/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 265529

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/22/14 12:40	1

GC/MS Semi VOA

Prep Batch: 126194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	3520C	
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-126194/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 126361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	8270C LL	126194
LCS 180-126194/2-A	Lab Control Sample	Total/NA	Water	8270C LL	126194
LCSD 180-126194/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	126194
MB 180-126194/1-A	Method Blank	Total/NA	Water	8270C LL	126194

HPLC/IC

Analysis Batch: 126067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	300.0	
LCS 180-126067/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-126067/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 126343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total Recoverable	Water	200.7	
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 126498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total Recoverable	Water	200.7 Rev 4.4	126343
LCS 180-126343/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	126343
MB 180-126343/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	126343

General Chemistry

Analysis Batch: 265529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	SM 4500 Cl F	
MB 500-265529/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 265708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	SM 2540D	
LCS 500-265708/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-265708/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 265921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 265921 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-265921/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 265963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39207-1	OC-FRAC2-112014	Total/NA	Water	420.4	265921
LCS 500-265921/2-A	Lab Control Sample	Total/NA	Water	420.4	265921
MB 500-265921/1-A	Method Blank	Total/NA	Water	420.4	265921

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		
Company: Olin Corporation				
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

180-39207 Chain of Custody

Analysis

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	S	N	N		
FRAC 2 - 112014	11-20-14	1330	G	Water			X		X	X	X	X	X		
				Water											

F - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	11-21-14		[signature]	11-21-14 1100	TA
2	[signature]	11-21-14 1100	TA	[signature]	11-22-14	TA
3	Relinquished by	Date/Time:	Company	Received by:	Date/Time: 10:15	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-39207 COC

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Gulchard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978.658.6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006863		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 2 - 112014	11.20.14	1330	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 11-21-14	Company	Received by:	Date/Time: 11-21-14 1100	Company TA
Relinquished by:	Date/Time: 11-21-14 1700	Company TA	Received by:	Date/Time: 11/22/14 1010	Company TAL
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: -0.8

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39207-1

Login Number: 39207

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39207-1

Login Number: 39207

List Source: TestAmerica Pittsburgh

List Number: 2

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39289-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/2/2014 11:37:55 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Job ID: 180-39289-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 11/26/2014 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 126530.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Client Sample ID: OC FRAC 4-112514

Lab Sample ID: 180-39289-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.59	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.23	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	210	B	5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	0.57	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	17		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Total Suspended Solids	2.0	J	5.0	1.6	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC FRAC 4-112514
Date Collected: 11/25/14 10:30
Date Received: 11/26/14 09:30

Lab Sample ID: 180-39289-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/26/14 11:12	11/28/14 20:36	1
Butyl benzyl phthalate	**0.59**	**J**	0.94	0.13	ug/L		11/26/14 11:12	11/28/14 20:36	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/26/14 11:12	11/28/14 20:36	1
Diethyl phthalate	**0.23**	**J B**	0.94	0.14	ug/L		11/26/14 11:12	11/28/14 20:36	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/26/14 11:12	11/28/14 20:36	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/26/14 11:12	11/28/14 20:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*85*		*16 - 122*	*11/26/14 11:12*	*11/28/14 20:36*	*1*
2-Fluorobiphenyl	*74*		*19 - 107*	*11/26/14 11:12*	*11/28/14 20:36*	*1*
2-Fluorophenol (Surr)	*66*		*10 - 111*	*11/26/14 11:12*	*11/28/14 20:36*	*1*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*	*11/26/14 11:12*	*11/28/14 20:36*	*1*
Phenol-d5 (Surr)	*66*		*15 - 112*	*11/26/14 11:12*	*11/28/14 20:36*	*1*
Terphenyl-d14	*83*		*10 - 132*	*11/26/14 11:12*	*11/28/14 20:36*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**210**	**B**	5.0	0.98	mg/L			11/26/14 17:04	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/30/14 08:31	12/01/14 12:15	1
Iron	ND		50	9.5	ug/L		11/30/14 08:31	12/01/14 12:15	1
Nickel	**0.57**	**J**	10	0.51	ug/L		11/30/14 08:31	12/01/14 12:15	1
Zinc	**17**		10	1.0	ug/L		11/30/14 08:31	12/01/14 12:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		11/28/14 12:52	11/28/14 16:53	1
Total Suspended Solids	**2.0**	**J**	5.0	1.6	mg/L			11/28/14 10:24	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			11/26/14 15:16	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39289-1	OC FRAC 4-112514	85	74	66	71	66	83		
LCS 180-126530/2-A	Lab Control Sample	73	65	70	65	66	59		
LCSD 180-126530/3-A	Lab Control Sample Dup	76	72	68	68	67	60		
MB 180-126530/1-A	Method Blank	70	70	69	70	64	66		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-126530/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 126648 — **Prep Batch: 126530**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/26/14 08:05	11/28/14 11:29	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/26/14 08:05	11/28/14 11:29	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/26/14 08:05	11/28/14 11:29	1
Diethyl phthalate	0.179	J	1.0	0.15	ug/L		11/26/14 08:05	11/28/14 11:29	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/26/14 08:05	11/28/14 11:29	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/26/14 08:05	11/28/14 11:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*	*11/26/14 08:05*	*11/28/14 11:29*	*1*
2-Fluorobiphenyl	*70*		*19 - 107*	*11/26/14 08:05*	*11/28/14 11:29*	*1*
2-Fluorophenol (Surr)	*69*		*10 - 111*	*11/26/14 08:05*	*11/28/14 11:29*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*11/26/14 08:05*	*11/28/14 11:29*	*1*
Phenol-d5 (Surr)	*64*		*15 - 112*	*11/26/14 08:05*	*11/28/14 11:29*	*1*
Terphenyl-d14	*66*		*10 - 132*	*11/26/14 08:05*	*11/28/14 11:29*	*1*

Lab Sample ID: LCS 180-126530/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 126648 — **Prep Batch: 126530**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.2		ug/L		66	20 - 116
Butyl benzyl phthalate	20.0	12.7		ug/L		64	36 - 108
Di-n-butyl phthalate	20.0	14.2		ug/L		71	37 - 111
Diethyl phthalate	20.0	13.7		ug/L		68	36 - 109
Dimethyl phthalate	20.0	13.4		ug/L		67	37 - 106
Di-n-octyl phthalate	20.0	12.0		ug/L		60	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*
2-Fluorobiphenyl	*65*		*19 - 107*
2-Fluorophenol (Surr)	*70*		*10 - 111*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*
Phenol-d5 (Surr)	*66*		*15 - 112*
Terphenyl-d14	*59*		*10 - 132*

Lab Sample ID: LCSD 180-126530/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 126648 — **Prep Batch: 126530**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	13.5		ug/L		68	20 - 116	2	40
Butyl benzyl phthalate	20.0	12.8		ug/L		64	36 - 108	0	40
Di-n-butyl phthalate	20.0	14.2		ug/L		71	37 - 111	0	38
Diethyl phthalate	20.0	14.7		ug/L		73	36 - 109	7	39
Dimethyl phthalate	20.0	15.0		ug/L		75	37 - 106	11	42
Di-n-octyl phthalate	20.0	11.7		ug/L		59	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-126530/3-A
Matrix: Water
Analysis Batch: 126648

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 126530

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*68*		*10 - 111*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*
Phenol-d5 (Surr)	*67*		*15 - 112*
Terphenyl-d14	*60*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-126562/6
Matrix: Water
Analysis Batch: 126562

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.276	J	1.0	0.20	mg/L			11/26/14 11:10	1

Lab Sample ID: LCS 180-126562/5
Matrix: Water
Analysis Batch: 126562

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.9		mg/L		102	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-126754/1-A
Matrix: Water
Analysis Batch: 126879

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 126754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/30/14 08:31	12/01/14 11:51	1
Iron	ND		50	9.5	ug/L		11/30/14 08:31	12/01/14 11:51	1
Nickel	ND		10	0.51	ug/L		11/30/14 08:31	12/01/14 11:51	1
Zinc	ND		10	1.0	ug/L		11/30/14 08:31	12/01/14 11:51	1

Lab Sample ID: LCS 180-126754/2-A
Matrix: Water
Analysis Batch: 126879

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 126754

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	543		ug/L		109	85 - 115
Iron	1000	1060		ug/L		106	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	520		ug/L		104	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-126754/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 126879 — **Prep Batch: 126754**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	551		ug/L		110	85 - 115	1	20
Iron	1000	1090		ug/L		109	85 - 115	3	20
Nickel	500	517		ug/L		103	85 - 115	2	20
Zinc	500	533		ug/L		107	85 - 115	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-266315/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 266470 — **Prep Batch: 266315**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		11/28/14 12:52	11/28/14 16:47	1

Lab Sample ID: LCS 500-266315/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 266470 — **Prep Batch: 266315**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.104		mg/L		104	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-266308/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 266308

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			11/28/14 10:22	1

Lab Sample ID: LCS 500-266308/1 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 266308

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	210		mg/L		105	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-266183/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 266183

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			11/26/14 15:15	1

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Method: SM 4500 Cl F - Chlorine, Residual (Continued)

Lab Sample ID: 180-39289-1 DU
Matrix: Water
Analysis Batch: 266183

Client Sample ID: OC FRAC 4-112514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

GC/MS Semi VOA

Prep Batch: 126530

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	3520C	
LCS 180-126530/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-126530/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-126530/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 126648

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	8270C LL	126530
LCS 180-126530/2-A	Lab Control Sample	Total/NA	Water	8270C LL	126530
LCSD 180-126530/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	126530
MB 180-126530/1-A	Method Blank	Total/NA	Water	8270C LL	126530

HPLC/IC

Analysis Batch: 126562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	300.0	
LCS 180-126562/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-126562/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 126754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total Recoverable	Water	200.7	
LCS 180-126754/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-126754/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-126754/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 126879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total Recoverable	Water	200.7 Rev 4.4	126754
LCS 180-126754/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	126754
LCSD 180-126754/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	126754
MB 180-126754/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	126754

General Chemistry

Analysis Batch: 266183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	SM 4500 Cl F	
180-39289-1 DU	OC FRAC 4-112514	Total/NA	Water	SM 4500 Cl F	
MB 500-266183/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 266308

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	SM 2540D	
LCS 500-266308/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-266308/2	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 266315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	Distill/Phenol	
LCS 500-266315/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-266315/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 266470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39289-1	OC FRAC 4-112514	Total/NA	Water	420.4	266315
LCS 500-266315/2-A	Lab Control Sample	Total/NA	Water	420.4	266315
MB 500-266315/1-A	Method Blank	Total/NA	Water	420.4	266315

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Client Sample ID: OC FRAC 4-112514
Date Collected: 11/25/14 10:30
Date Received: 11/26/14 09:30

Lab Sample ID: 180-39289-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	126530	11/26/14 11:12	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	126648	11/28/14 20:36	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		126562	11/26/14 17:04	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	126754	11/30/14 08:31	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	126879	12/01/14 12:15	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	102 mL	266315	11/28/14 12:52	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	102 mL	266470	11/28/14 16:53	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	266308		MTB	TAL CHI
	Instrument ID: NOEQUIP							(Start) 11/28/14 10:24		
								(End) 11/28/14 10:26		
Total/NA	Analysis	SM 4500 Cl F		1			266183	11/26/14 15:16	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

Lab: TAL PIT

Batch Type: Prep

JPM = Jeremy Merriman

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39289-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39289-1	OC FRAC 4-112514	Water	11/25/14 10:30	11/26/14 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG FA	Project #: 48006853			K - EDTA W - ph 4-5 L - EDA Z - other (specify) Other:
Site:	SSOW#:			

180-39289 Chain of Custody

ahydrate

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containe	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC4-112514	11-25-14	1030	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 11-25-14	Company	Received by:	Date/Time: 11-25-14 1100	Company TP		
Relinquished by:	Date/Time: 11-25-14 1100	Company TP	Received by:	Date/Time: 11-26-14 9:30	Company FA		
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company		

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39289-1

Login Number: 39289

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39289-1

Login Number: 39289

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39289-1

Login Number: 39289
List Number: 3
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago
List Creation: 11/26/14 11:10 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39404-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
12/9/2014 9:03:19 AM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Job ID: 180-39404-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-39404-1

Receipt
The sample was received on 12/3/2014 9:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 127053. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39404-1	OC-FRAC 5-120214	Water	12/02/14 10:10	12/03/14 09:40

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Client Sample ID: OC-FRAC 5-120214
Date Collected: 12/02/14 10:10
Date Received: 12/03/14 09:40

Lab Sample ID: 180-39404-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	127053	12/03/14 12:49	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	127218	12/04/14 14:45	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL		127037	12/03/14 12:59	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	127273	12/04/14 15:58	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	127610	12/08/14 12:28	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	103 mL	267061	12/04/14 12:27	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	103 mL	267081	12/04/14 14:31	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	267066		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	12/04/14 12:18		
							(End)	12/04/14 12:20		
Total/NA	Analysis	SM 4500 Cl F		1			266916	12/03/14 15:51	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Client Sample ID: OC-FRAC 5-120214
Date Collected: 12/02/14 10:10
Date Received: 12/03/14 09:40

Lab Sample ID: 180-39404-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/03/14 12:49	12/04/14 14:45	1
Butyl benzyl phthalate	**0.63**	**J**	0.94	0.13	ug/L		12/03/14 12:49	12/04/14 14:45	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/03/14 12:49	12/04/14 14:45	1
Diethyl phthalate	**0.19**	**J**	0.94	0.14	ug/L		12/03/14 12:49	12/04/14 14:45	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/03/14 12:49	12/04/14 14:45	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/03/14 12:49	12/04/14 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*12/03/14 12:49*	*12/04/14 14:45*	*1*
2-Fluorobiphenyl	*57*		*19 - 107*	*12/03/14 12:49*	*12/04/14 14:45*	*1*
2-Fluorophenol (Surr)	*47*		*10 - 111*	*12/03/14 12:49*	*12/04/14 14:45*	*1*
Nitrobenzene-d5 (Surr)	*58*		*23 - 112*	*12/03/14 12:49*	*12/04/14 14:45*	*1*
Phenol-d5 (Surr)	*52*		*15 - 112*	*12/03/14 12:49*	*12/04/14 14:45*	*1*
Terphenyl-d14	*75*		*10 - 132*	*12/03/14 12:49*	*12/04/14 14:45*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**220**		5.0	0.98	mg/L			12/03/14 12:59	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/04/14 15:58	12/08/14 12:28	1
Iron	ND		50	9.5	ug/L		12/04/14 15:58	12/08/14 12:28	1
Nickel	**0.95**	**J B**	10	0.51	ug/L		12/04/14 15:58	12/08/14 12:28	1
Zinc	**19**	**B**	10	1.0	ug/L		12/04/14 15:58	12/08/14 12:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		12/04/14 12:27	12/04/14 14:31	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/04/14 12:18	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/03/14 15:51	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-127053/1-A
Matrix: Water
Analysis Batch: 127218

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 127053

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/03/14 09:25	12/04/14 11:11	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/03/14 09:25	12/04/14 11:11	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/03/14 09:25	12/04/14 11:11	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/03/14 09:25	12/04/14 11:11	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/03/14 09:25	12/04/14 11:11	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/03/14 09:25	12/04/14 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*	*12/03/14 09:25*	*12/04/14 11:11*	*1*
2-Fluorobiphenyl	*66*		*19 - 107*	*12/03/14 09:25*	*12/04/14 11:11*	*1*
2-Fluorophenol (Surr)	*66*		*10 - 111*	*12/03/14 09:25*	*12/04/14 11:11*	*1*
Nitrobenzene-d5 (Surr)	*67*		*23 - 112*	*12/03/14 09:25*	*12/04/14 11:11*	*1*
Phenol-d5 (Surr)	*68*		*15 - 112*	*12/03/14 09:25*	*12/04/14 11:11*	*1*
Terphenyl-d14	*72*		*10 - 132*	*12/03/14 09:25*	*12/04/14 11:11*	*1*

Lab Sample ID: LCS 180-127053/2-A
Matrix: Water
Analysis Batch: 127218

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 127053

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.7		ug/L		83	20 - 116
Butyl benzyl phthalate	20.0	16.9		ug/L		84	36 - 108
Di-n-butyl phthalate	20.0	15.6		ug/L		78	37 - 111
Diethyl phthalate	20.0	14.4		ug/L		72	36 - 109
Dimethyl phthalate	20.0	14.8		ug/L		74	37 - 106
Di-n-octyl phthalate	20.0	17.7		ug/L		89	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*82*		*16 - 122*
2-Fluorobiphenyl	*73*		*19 - 107*
2-Fluorophenol (Surr)	*70*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*70*		*15 - 112*
Terphenyl-d14	*76*		*10 - 132*

Lab Sample ID: LCSD 180-127053/3-A
Matrix: Water
Analysis Batch: 127218

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 127053

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	16.7		ug/L		83	20 - 116	0	40
Butyl benzyl phthalate	20.0	16.4		ug/L		82	36 - 108	3	40
Di-n-butyl phthalate	20.0	15.8		ug/L		79	37 - 111	1	38
Diethyl phthalate	20.0	15.2		ug/L		76	36 - 109	5	39
Dimethyl phthalate	20.0	15.3		ug/L		76	37 - 106	3	42
Di-n-octyl phthalate	20.0	17.9		ug/L		89	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-127053/3-A
Matrix: Water
Analysis Batch: 127218

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 127053

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*83*		*16 - 122*
2-Fluorobiphenyl	*76*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*73*		*23 - 112*
Phenol-d5 (Surr)	*73*		*15 - 112*
Terphenyl-d14	*73*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-127037/6
Matrix: Water
Analysis Batch: 127037

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/03/14 09:31	1

Lab Sample ID: LCS 180-127037/5
Matrix: Water
Analysis Batch: 127037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.5		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-127273/1-A
Matrix: Water
Analysis Batch: 127610

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 127273

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/04/14 15:58	12/08/14 12:18	1
Iron	12.2	J	50	9.5	ug/L		12/04/14 15:58	12/08/14 12:18	1
Nickel	0.590	J	10	0.51	ug/L		12/04/14 15:58	12/08/14 12:18	1
Zinc	3.36	J	10	1.0	ug/L		12/04/14 15:58	12/08/14 12:18	1

Lab Sample ID: LCS 180-127273/2-A
Matrix: Water
Analysis Batch: 127610

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127273

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	542		ug/L		108	85 - 115
Iron	1000	1000		ug/L		100	85 - 115
Nickel	500	528		ug/L		106	85 - 115
Zinc	500	518		ug/L		104	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-39404-1 MS — **Client Sample ID: OC-FRAC 5-120214**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 127610 — **Prep Batch: 127273**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	563		ug/L		113	70 - 130
Iron	ND		1000	1000		ug/L		100	70 - 130
Nickel	0.95	J B	500	532		ug/L		106	70 - 130
Zinc	19	B	500	519		ug/L		100	70 - 130

Lab Sample ID: 180-39404-1 MSD — **Client Sample ID: OC-FRAC 5-120214**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 127610 — **Prep Batch: 127273**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	561		ug/L		112	70 - 130	0	20
Iron	ND		1000	1020		ug/L		102	70 - 130	2	20
Nickel	0.95	J B	500	537		ug/L		107	70 - 130	1	20
Zinc	19	B	500	525		ug/L		101	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-267061/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 267081 — **Prep Batch: 267061**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		12/04/14 12:27	12/04/14 14:28	1

Lab Sample ID: LCS 500-267061/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 267081 — **Prep Batch: 267061**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.101		mg/L		101	90 - 110

Lab Sample ID: 180-39404-1 MS — **Client Sample ID: OC-FRAC 5-120214**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 267081 — **Prep Batch: 267061**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.100		mg/L		100	75 - 125

Lab Sample ID: 180-39404-1 MSD — **Client Sample ID: OC-FRAC 5-120214**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 267081 — **Prep Batch: 267061**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0997		mg/L		100	75 - 125	1	20

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39404-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-267066/1
Matrix: Water
Analysis Batch: 267066

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/04/14 11:50	1

Lab Sample ID: LCS 500-267066/2
Matrix: Water
Analysis Batch: 267066

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	189		mg/L		95	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-266916/1
Matrix: Water
Analysis Batch: 266916

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/03/14 15:50	1

Lab Sample ID: 180-39404-1 DU
Matrix: Water
Analysis Batch: 266916

Client Sample ID: OC-FRAC 5-120214
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 127053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	3520C	
LCS 180-127053/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-127053/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-127053/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 127218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	8270C LL	127053
LCS 180-127053/2-A	Lab Control Sample	Total/NA	Water	8270C LL	127053
LCSD 180-127053/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	127053
MB 180-127053/1-A	Method Blank	Total/NA	Water	8270C LL	127053

HPLC/IC

Analysis Batch: 127037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	300.0	
LCS 180-127037/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-127037/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 127273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total Recoverable	Water	200.7	
180-39404-1 MS	OC-FRAC 5-120214	Total Recoverable	Water	200.7	
180-39404-1 MSD	OC-FRAC 5-120214	Total Recoverable	Water	200.7	
LCS 180-127273/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-127273/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 127610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total Recoverable	Water	200.7 Rev 4.4	127273
180-39404-1 MS	OC-FRAC 5-120214	Total Recoverable	Water	200.7 Rev 4.4	127273
180-39404-1 MSD	OC-FRAC 5-120214	Total Recoverable	Water	200.7 Rev 4.4	127273
LCS 180-127273/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	127273
MB 180-127273/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	127273

General Chemistry

Analysis Batch: 266916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	SM 4500 Cl F	
180-39404-1 DU	OC-FRAC 5-120214	Total/NA	Water	SM 4500 Cl F	
MB 500-266916/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 267061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	Distill/Phenol	
180-39404-1 MS	OC-FRAC 5-120214	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 267061 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1 MSD	OC-FRAC 5-120214	Total/NA	Water	Distill/Phenol	
LCS 500-267061/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-267061/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 267066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	SM 2540D	
LCS 500-267066/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-267066/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 267081

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39404-1	OC-FRAC 5-120214	Total/NA	Water	420.4	267061
180-39404-1 MS	OC-FRAC 5-120214	Total/NA	Water	420.4	267061
180-39404-1 MSD	OC-FRAC 5-120214	Total/NA	Water	420.4	267061
LCS 500-267061/2-A	Lab Control Sample	Total/NA	Water	420.4	267061
MB 500-267061/1-A	Method Blank	Total/NA	Water	420.4	267061

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

180-39404 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@tes	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 5 - 120214	12-2-14	1010	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: Lucy Johnson	Date/Time: 12-2-14	Company	Received by:	Date/Time: 12-2-14 1730	Company TA
Relinquished by:	Date/Time: 12-2-14 1645	Company TA	Received by: Debbie Watson	Date/Time: 12-3-14 9:40	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information

Client Contact: Mr. Brian Guichard	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):
Company: Olin Corporation	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	COC No: 480-41314-10069.1
Address: 51 Eames street	Due Date Requested:		Page: Page 1 of 1
City: Wilmington	TAT Requested (days): A.S.A.P.		Job #:
State, Zip: MA, 01887	PO #: REWI0020		
Phone: 978-658-6121	WO #:		
Email: beguichard@olin.com	Project #: 48006863		
Project Name: Wilmington Plant B RPG	SSOW#:		
Site:			

180-39404 COC

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 5 · 120214	12·2·14	1010	G	Water			X		X	X	X	X	X		
				Water											

4500.Cl F, Chloride
200.7
8270 LL.
To Pittsburgh
Rest To Chicago.

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: Lucy Johnson	Date/Time: 12·2·14	Company	Received by:	Date/Time: 12-2-14 1830	Company TA
Relinquished by:	Date/Time: 12-2-14 1645	Company TA	Received by:	Date/Time: 12-3-14 0820	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∧ Yes ∧ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: temp (1.7, 2.2)

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39404-1

Login Number: 39404

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39404-1

Login Number: 39404

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39589-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/12/2014 6:44:32 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Job ID: 180-39589-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/6/2014 10:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.6º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 127568. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Client Sample ID: OC-FRAC 3-120514

Lab Sample ID: 180-39589-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.35	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	230		5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	1.5	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	14		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 3-120514
Date Collected: 12/05/14 10:00
Date Received: 12/06/14 10:45

Lab Sample ID: 180-39589-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/08/14 11:39	12/09/14 14:40	1
Butyl benzyl phthalate	**0.35**	**J**	0.94	0.13	ug/L		12/08/14 11:39	12/09/14 14:40	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/08/14 11:39	12/09/14 14:40	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/08/14 11:39	12/09/14 14:40	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/08/14 11:39	12/09/14 14:40	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/08/14 11:39	12/09/14 14:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*74*		*16 - 122*	*12/08/14 11:39*	*12/09/14 14:40*	*1*
2-Fluorobiphenyl	*67*		*19 - 107*	*12/08/14 11:39*	*12/09/14 14:40*	*1*
2-Fluorophenol (Surr)	*57*		*10 - 111*	*12/08/14 11:39*	*12/09/14 14:40*	*1*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*	*12/08/14 11:39*	*12/09/14 14:40*	*1*
Phenol-d5 (Surr)	*64*		*15 - 112*	*12/08/14 11:39*	*12/09/14 14:40*	*1*
Terphenyl-d14	*91*		*10 - 132*	*12/08/14 11:39*	*12/09/14 14:40*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**230**		5.0	0.98	mg/L			12/06/14 18:47	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/09/14 04:43	12/10/14 13:19	1
Iron	ND		50	9.5	ug/L		12/09/14 04:43	12/10/14 13:19	1
Nickel	**1.5**	**J**	10	0.51	ug/L		12/09/14 04:43	12/10/14 13:19	1
Zinc	**14**		10	1.0	ug/L		12/09/14 04:43	12/10/14 13:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/09/14 10:43	12/09/14 14:36	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/08/14 11:35	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/07/14 16:11	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39589-1	OC-FRAC 3-120514	74	67	57	66	64	91		
LCS 180-127568/2-A	Lab Control Sample	68	62	44	58	55	62		
LCSD 180-127568/3-A	Lab Control Sample Dup	68	61	44	57	53	62		
MB 180-127568/1-A	Method Blank	59	61	55	60	59	64		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-127568/1-A
Matrix: Water
Analysis Batch: 127673

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 127568

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/08/14 11:39	12/09/14 10:36	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/08/14 11:39	12/09/14 10:36	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/08/14 11:39	12/09/14 10:36	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/08/14 11:39	12/09/14 10:36	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/08/14 11:39	12/09/14 10:36	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/08/14 11:39	12/09/14 10:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*16 - 122*	*12/08/14 11:39*	*12/09/14 10:36*	*1*
2-Fluorobiphenyl	*61*		*19 - 107*	*12/08/14 11:39*	*12/09/14 10:36*	*1*
2-Fluorophenol (Surr)	*55*		*10 - 111*	*12/08/14 11:39*	*12/09/14 10:36*	*1*
Nitrobenzene-d5 (Surr)	*60*		*23 - 112*	*12/08/14 11:39*	*12/09/14 10:36*	*1*
Phenol-d5 (Surr)	*59*		*15 - 112*	*12/08/14 11:39*	*12/09/14 10:36*	*1*
Terphenyl-d14	*64*		*10 - 132*	*12/08/14 11:39*	*12/09/14 10:36*	*1*

Lab Sample ID: LCS 180-127568/2-A
Matrix: Water
Analysis Batch: 127673

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 127568

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.9		ug/L		69	20 - 116
Butyl benzyl phthalate	20.0	13.6		ug/L		68	36 - 108
Di-n-butyl phthalate	20.0	13.6		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.4		ug/L		67	36 - 109
Dimethyl phthalate	20.0	12.6		ug/L		63	37 - 106
Di-n-octyl phthalate	20.0	14.3		ug/L		71	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*62*		*19 - 107*
2-Fluorophenol (Surr)	*44*		*10 - 111*
Nitrobenzene-d5 (Surr)	*58*		*23 - 112*
Phenol-d5 (Surr)	*55*		*15 - 112*
Terphenyl-d14	*62*		*10 - 132*

Lab Sample ID: LCSD 180-127568/3-A
Matrix: Water
Analysis Batch: 127673

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 127568

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.0		ug/L		70	20 - 116	1	40
Butyl benzyl phthalate	20.0	13.6		ug/L		68	36 - 108	0	40
Di-n-butyl phthalate	20.0	13.2		ug/L		66	37 - 111	3	38
Diethyl phthalate	20.0	13.3		ug/L		66	36 - 109	1	39
Dimethyl phthalate	20.0	12.6		ug/L		63	37 - 106	0	42
Di-n-octyl phthalate	20.0	14.6		ug/L		73	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-127568/3-A
Matrix: Water
Analysis Batch: 127673

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 127568

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*61*		*19 - 107*
2-Fluorophenol (Surr)	*44*		*10 - 111*
Nitrobenzene-d5 (Surr)	*57*		*23 - 112*
Phenol-d5 (Surr)	*53*		*15 - 112*
Terphenyl-d14	*62*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-127454/6
Matrix: Water
Analysis Batch: 127454

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/06/14 12:19	1

Lab Sample ID: LCS 180-127454/5
Matrix: Water
Analysis Batch: 127454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.5		mg/L		101	90 - 110

Lab Sample ID: 180-39589-1 MS
Matrix: Water
Analysis Batch: 127454

Client Sample ID: OC-FRAC 3-120514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	230		125	359		mg/L		107	80 - 120

Lab Sample ID: 180-39589-1 MSD
Matrix: Water
Analysis Batch: 127454

Client Sample ID: OC-FRAC 3-120514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	230		125	357		mg/L		106	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-127628/1-A
Matrix: Water
Analysis Batch: 127909

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 127628

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/09/14 04:43	12/10/14 13:09	1
Iron	ND		50	9.5	ug/L		12/09/14 04:43	12/10/14 13:09	1
Nickel	ND		10	0.51	ug/L		12/09/14 04:43	12/10/14 13:09	1
Zinc	ND		10	1.0	ug/L		12/09/14 04:43	12/10/14 13:09	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-127628/2-A
Matrix: Water
Analysis Batch: 127909

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127628

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	525		ug/L		105	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	507		ug/L		101	85 - 115
Zinc	500	501		ug/L		100	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-267670/1-A
Matrix: Water
Analysis Batch: 267728

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 267670

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/09/14 10:43	12/09/14 14:29	1

Lab Sample ID: LCS 500-267670/2-A
Matrix: Water
Analysis Batch: 267728

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 267670

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0950		mg/L		95	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-267536/1
Matrix: Water
Analysis Batch: 267536

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/08/14 11:20	1

Lab Sample ID: LCS 500-267536/2
Matrix: Water
Analysis Batch: 267536

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	177		mg/L		89	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-267744/1
Matrix: Water
Analysis Batch: 267744

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/07/14 16:10	1

Method: SM 4500 Cl F - Chlorine, Residual (Continued)

Lab Sample ID: 180-39589-1 DU
Matrix: Water
Analysis Batch: 267744

Client Sample ID: OC-FRAC 3-120514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

GC/MS Semi VOA

Prep Batch: 127568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	3520C	
LCS 180-127568/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-127568/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-127568/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 127673

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	8270C LL	127568
LCS 180-127568/2-A	Lab Control Sample	Total/NA	Water	8270C LL	127568
LCSD 180-127568/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	127568
MB 180-127568/1-A	Method Blank	Total/NA	Water	8270C LL	127568

HPLC/IC

Analysis Batch: 127454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	300.0	
180-39589-1 MS	OC-FRAC 3-120514	Total/NA	Water	300.0	
180-39589-1 MSD	OC-FRAC 3-120514	Total/NA	Water	300.0	
LCS 180-127454/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-127454/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 127628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total Recoverable	Water	200.7	
LCS 180-127628/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-127628/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 127909

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total Recoverable	Water	200.7 Rev 4.4	127628
LCS 180-127628/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	127628
MB 180-127628/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	127628

General Chemistry

Analysis Batch: 267536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	SM 2540D	
LCS 500-267536/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-267536/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 267670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	Distill/Phenol	
LCS 500-267670/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-267670/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Analysis Batch: 267728

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	420.4	267670
LCS 500-267670/2-A	Lab Control Sample	Total/NA	Water	420.4	267670
MB 500-267670/1-A	Method Blank	Total/NA	Water	420.4	267670

Analysis Batch: 267744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39589-1	OC-FRAC 3-120514	Total/NA	Water	SM 4500 Cl F	
180-39589-1 DU	OC-FRAC 3-120514	Total/NA	Water	SM 4500 Cl F	
MB 500-267744/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Client Sample ID: OC-FRAC 3-120514
Date Collected: 12/05/14 10:00
Date Received: 12/06/14 10:45

Lab Sample ID: 180-39589-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	127568	12/08/14 11:39	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	127673	12/09/14 14:40	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL		127454	12/06/14 18:47	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	127628	12/09/14 04:43	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	127909	12/10/14 13:19	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	267670	12/09/14 10:43	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	267728	12/09/14 14:36	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	267536		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 12/08/14 11:35		
								(End) 12/08/14 11:37		
Total/NA	Analysis	SM 4500 Cl F		1			267744	12/07/14 16:11	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

CMR = Carl Reagle

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39589-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39589-1	OC-FRAC 3-120514	Water	12/05/14 10:00	12/06/14 10:45

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

BNA's 3226 36CC MAA 7AA

180-39589 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page:
Company: Olin Corporation				
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Codes:
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 3 - 120514	12-5-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 12-5-14	Company	Received by:	Date/Time: 12-5-14 1145	Company	
Relinquished by:	Date/Time: 12-5-14 1800	Company TA	Received by:	Date/Time: 12-6-14	Company TA	
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 10:15	Company	

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39589-1

Login Number: 39589

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39589-1

Login Number: 39589

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39589-1

Login Number: 39589
List Number: 3
Creator: Scott, Sherri L

List Source: TestAmerica Chicago
List Creation: 12/08/14 08:42 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39782-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/16/2014 2:15:35 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Job ID: 180-39782-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/11/2014 9:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.2º C.

GC/MS Semi VOA
Method 8270C LL: An incorrect volume of surrogate spiking solution was inadvertently added the following samples: (180-39782-1).
Percent recoveries are based on the amount spiked.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 128197. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Client Sample ID: OC-FRAC 1-121014

Lab Sample ID: 180-39782-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.52	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	220		5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	0.89	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	13		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 1-121014
Date Collected: 12/10/14 11:00
Date Received: 12/11/14 09:00

Lab Sample ID: 180-39782-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/12/14 16:17	12/15/14 14:48	1
Butyl benzyl phthalate	**0.52**	**J**	0.94	0.13	ug/L		12/12/14 16:17	12/15/14 14:48	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/12/14 16:17	12/15/14 14:48	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/12/14 16:17	12/15/14 14:48	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/12/14 16:17	12/15/14 14:48	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/12/14 16:17	12/15/14 14:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*66*		*16 - 122*	*12/12/14 16:17*	*12/15/14 14:48*	*1*
2-Fluorobiphenyl	*55*		*19 - 107*	*12/12/14 16:17*	*12/15/14 14:48*	*1*
2-Fluorophenol (Surr)	*54*		*10 - 111*	*12/12/14 16:17*	*12/15/14 14:48*	*1*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*	*12/12/14 16:17*	*12/15/14 14:48*	*1*
Phenol-d5 (Surr)	*60*		*15 - 112*	*12/12/14 16:17*	*12/15/14 14:48*	*1*
Terphenyl-d14	*67*		*10 - 132*	*12/12/14 16:17*	*12/15/14 14:48*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**220**		5.0	0.98	mg/L			12/14/14 15:35	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/14/14 10:20	12/16/14 11:28	1
Iron	ND		50	9.5	ug/L		12/14/14 10:20	12/16/14 11:28	1
Nickel	**0.89**	**J**	10	0.51	ug/L		12/14/14 10:20	12/16/14 11:28	1
Zinc	**13**		10	1.0	ug/L		12/14/14 10:20	12/16/14 11:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/12/14 11:25	12/12/14 13:36	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/12/14 10:26	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/11/14 12:16	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39782-1	OC-FRAC 1-121014	66	55	54	59	60	67		
LCS 180-128197/2-A	Lab Control Sample	67	60	70	68	73	72		
LCSD 180-128197/3-A	Lab Control Sample Dup	70	62	72	70	75	73		
MB 180-128197/1-A	Method Blank	60	57	64	64	67	63		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128197/1-A
Matrix: Water
Analysis Batch: 128321

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128197

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/12/14 16:17	12/15/14 11:42	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/12/14 16:17	12/15/14 11:42	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/12/14 16:17	12/15/14 11:42	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/12/14 16:17	12/15/14 11:42	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/12/14 16:17	12/15/14 11:42	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/12/14 16:17	12/15/14 11:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*12/12/14 16:17*	*12/15/14 11:42*	*1*
2-Fluorobiphenyl	*57*		*19 - 107*	*12/12/14 16:17*	*12/15/14 11:42*	*1*
2-Fluorophenol (Surr)	*64*		*10 - 111*	*12/12/14 16:17*	*12/15/14 11:42*	*1*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*	*12/12/14 16:17*	*12/15/14 11:42*	*1*
Phenol-d5 (Surr)	*67*		*15 - 112*	*12/12/14 16:17*	*12/15/14 11:42*	*1*
Terphenyl-d14	*63*		*10 - 132*	*12/12/14 16:17*	*12/15/14 11:42*	*1*

Lab Sample ID: LCS 180-128197/2-A
Matrix: Water
Analysis Batch: 128321

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128197

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.4		ug/L		82	20 - 116
Butyl benzyl phthalate	20.0	16.8		ug/L		84	36 - 108
Di-n-butyl phthalate	20.0	13.3		ug/L		67	37 - 111
Diethyl phthalate	20.0	12.2		ug/L		61	36 - 109
Dimethyl phthalate	20.0	13.2		ug/L		66	37 - 106
Di-n-octyl phthalate	20.0	16.9		ug/L		84	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*60*		*19 - 107*
2-Fluorophenol (Surr)	*70*		*10 - 111*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*
Phenol-d5 (Surr)	*73*		*15 - 112*
Terphenyl-d14	*72*		*10 - 132*

Lab Sample ID: LCSD 180-128197/3-A
Matrix: Water
Analysis Batch: 128321

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128197

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.0		ug/L		85	20 - 116	3	40
Butyl benzyl phthalate	20.0	17.1		ug/L		85	36 - 108	2	40
Di-n-butyl phthalate	20.0	13.7		ug/L		69	37 - 111	3	38
Diethyl phthalate	20.0	12.6		ug/L		63	36 - 109	3	39
Dimethyl phthalate	20.0	13.5		ug/L		68	37 - 106	2	42
Di-n-octyl phthalate	20.0	17.5		ug/L		87	11 - 127	3	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128197/3-A
Matrix: Water
Analysis Batch: 128321

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128197

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*
2-Fluorobiphenyl	*62*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*
Phenol-d5 (Surr)	*75*		*15 - 112*
Terphenyl-d14	*73*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128250/6
Matrix: Water
Analysis Batch: 128250

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/14/14 11:15	1

Lab Sample ID: LCS 180-128250/5
Matrix: Water
Analysis Batch: 128250

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.1		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-128244/1-A
Matrix: Water
Analysis Batch: 128494

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 128244

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/14/14 10:20	12/16/14 11:23	1
Iron	ND		50	9.5	ug/L		12/14/14 10:20	12/16/14 11:23	1
Nickel	ND		10	0.51	ug/L		12/14/14 10:20	12/16/14 11:23	1
Zinc	ND		10	1.0	ug/L		12/14/14 10:20	12/16/14 11:23	1

Lab Sample ID: LCS 180-128244/2-A
Matrix: Water
Analysis Batch: 128494

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 128244

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	533		ug/L		107	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	504		ug/L		101	85 - 115
Zinc	500	509		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-268316/1-A
Matrix: Water
Analysis Batch: 268353

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 268316

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/12/14 11:25	12/12/14 13:34	1

Lab Sample ID: LCS 500-268316/2-A
Matrix: Water
Analysis Batch: 268353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 268316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0904		mg/L		90	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-268288/1
Matrix: Water
Analysis Batch: 268288

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/12/14 10:26	1

Lab Sample ID: LCS 500-268288/2
Matrix: Water
Analysis Batch: 268288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	191		mg/L		96	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-268099/1
Matrix: Water
Analysis Batch: 268099

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/11/14 12:15	1

Lab Sample ID: 180-39782-1 DU
Matrix: Water
Analysis Batch: 268099

Client Sample ID: OC-FRAC 1-121014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 128197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	3520C	
LCS 180-128197/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128197/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128197/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 128321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	8270C LL	128197
LCS 180-128197/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128197
LCSD 180-128197/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128197
MB 180-128197/1-A	Method Blank	Total/NA	Water	8270C LL	128197

HPLC/IC

Analysis Batch: 128250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	300.0	
LCS 180-128250/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128250/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 128244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total Recoverable	Water	200.7	
LCS 180-128244/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-128244/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 128494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total Recoverable	Water	200.7 Rev 4.4	128244
LCS 180-128244/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	128244
MB 180-128244/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	128244

General Chemistry

Analysis Batch: 268099

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	SM 4500 Cl F	
180-39782-1 DU	OC-FRAC 1-121014	Total/NA	Water	SM 4500 Cl F	
MB 500-268099/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 268288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	SM 2540D	
LCS 500-268288/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-268288/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 268316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	Distill/Phenol	
LCS 500-268316/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-268316/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 268353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39782-1	OC-FRAC 1-121014	Total/NA	Water	420.4	268316
LCS 500-268316/2-A	Lab Control Sample	Total/NA	Water	420.4	268316
MB 500-268316/1-A	Method Blank	Total/NA	Water	420.4	268316

Client Sample ID: OC-FRAC 1-121014 — **Lab Sample ID: 180-39782-1**

Date Collected: 12/10/14 11:00 — **Matrix: Water**

Date Received: 12/11/14 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	128197	12/12/14 16:17	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	128321	12/15/14 14:48	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		128250	12/14/14 15:35	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	128244	12/14/14 10:20	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	128494	12/16/14 11:28	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	268316	12/12/14 11:25	MTB	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	268353	12/12/14 13:36	MTB	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	268288	12/12/14 10:26	SMO	TAL CHI
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 4500 Cl F		1			268099	12/11/14 12:16	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

MTB = Mary Brogan

Batch Type: Analysis

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

CMR = Carl Reagle

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39782-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39782-1	OC-FRAC 1-121014	Water	12/10/14 11:00	12/11/14 09:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 1 · 121014	12-10-14	1100	G	Water			X		X	X	X	X	X		
				Water											

180-39782 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by: L Johnson	Date/Time: 12-10-14 1445	Company	Received by: Jerry Dodd	Date/Time: 12-10-14 1445	Company
Relinquished by: Jerry Dodd	Date/Time: 12-10-14 1645	Company	Received by: Debbie Walsh	Date/Time: 12-11-14 9:06	Company
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

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12/16/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39782-1

Login Number: 39782

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39782-1

Login Number: 39782

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39835-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/18/2014 3:03:29 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Job ID: 180-39835-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/13/2014 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.7º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 128382. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Client Sample ID: OC-FRAC 2-121214

Lab Sample ID: 180-39835-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.23	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	200		5.0	0.98	mg/L	5		300.0	Total/NA
Iron	11	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.2	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	14	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Client Sample ID: OC-FRAC 2-121214
Date Collected: 12/12/14 10:00
Date Received: 12/13/14 09:15

Lab Sample ID: 180-39835-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/15/14 14:30	12/16/14 22:48	1
Butyl benzyl phthalate	**0.23**	**J**	0.94	0.13	ug/L		12/15/14 14:30	12/16/14 22:48	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/15/14 14:30	12/16/14 22:48	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/15/14 14:30	12/16/14 22:48	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/15/14 14:30	12/16/14 22:48	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/15/14 14:30	12/16/14 22:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*	*12/15/14 14:30*	*12/16/14 22:48*	*1*
2-Fluorobiphenyl	*68*		*19 - 107*	*12/15/14 14:30*	*12/16/14 22:48*	*1*
2-Fluorophenol (Surr)	*65*		*10 - 111*	*12/15/14 14:30*	*12/16/14 22:48*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*	*12/15/14 14:30*	*12/16/14 22:48*	*1*
Phenol-d5 (Surr)	*69*		*15 - 112*	*12/15/14 14:30*	*12/16/14 22:48*	*1*
Terphenyl-d14	*72*		*10 - 132*	*12/15/14 14:30*	*12/16/14 22:48*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		5.0	0.98	mg/L			12/13/14 15:03	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/15/14 10:01	12/18/14 11:02	1
Iron	**11**	**J**	50	9.5	ug/L		12/15/14 10:01	12/18/14 11:02	1
Nickel	**1.2**	**J**	10	0.51	ug/L		12/15/14 10:01	12/18/14 11:02	1
Zinc	**14**	**B**	10	1.0	ug/L		12/15/14 10:01	12/18/14 11:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		12/17/14 10:39	12/17/14 14:19	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/15/14 15:02	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/15/14 14:41	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39835-1	OC-FRAC 2-121214	75	68	65	74	69	72		
LCS 180-128382/2-A	Lab Control Sample	73	64	64	67	64	62		
LCSD 180-128382/3-A	Lab Control Sample Dup	77	67	67	69	66	61		
MB 180-128382/1-A	Method Blank	64	59	60	61	62	61		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128382/1-A
Matrix: Water
Analysis Batch: 128495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128382

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/15/14 14:30	12/16/14 15:10	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/15/14 14:30	12/16/14 15:10	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/15/14 14:30	12/16/14 15:10	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/15/14 14:30	12/16/14 15:10	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/15/14 14:30	12/16/14 15:10	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/15/14 14:30	12/16/14 15:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*64*		*16 - 122*	*12/15/14 14:30*	*12/16/14 15:10*	*1*
2-Fluorobiphenyl	*59*		*19 - 107*	*12/15/14 14:30*	*12/16/14 15:10*	*1*
2-Fluorophenol (Surr)	*60*		*10 - 111*	*12/15/14 14:30*	*12/16/14 15:10*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*12/15/14 14:30*	*12/16/14 15:10*	*1*
Phenol-d5 (Surr)	*62*		*15 - 112*	*12/15/14 14:30*	*12/16/14 15:10*	*1*
Terphenyl-d14	*61*		*10 - 132*	*12/15/14 14:30*	*12/16/14 15:10*	*1*

Lab Sample ID: LCS 180-128382/2-A
Matrix: Water
Analysis Batch: 128495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128382

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.8		ug/L		69	20 - 116
Butyl benzyl phthalate	20.0	13.5		ug/L		67	36 - 108
Di-n-butyl phthalate	20.0	14.2		ug/L		71	37 - 111
Diethyl phthalate	20.0	13.6		ug/L		68	36 - 109
Dimethyl phthalate	20.0	13.1		ug/L		65	37 - 106
Di-n-octyl phthalate	20.0	14.1		ug/L		71	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*64*		*10 - 111*
Nitrobenzene-d5 (Surr)	*67*		*23 - 112*
Phenol-d5 (Surr)	*64*		*15 - 112*
Terphenyl-d14	*62*		*10 - 132*

Lab Sample ID: LCSD 180-128382/3-A
Matrix: Water
Analysis Batch: 128495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128382

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.3		ug/L		72	20 - 116	4	40
Butyl benzyl phthalate	20.0	13.9		ug/L		70	36 - 108	3	40
Di-n-butyl phthalate	20.0	14.9		ug/L		74	37 - 111	5	38
Diethyl phthalate	20.0	14.7		ug/L		73	36 - 109	8	39
Dimethyl phthalate	20.0	14.2		ug/L		71	37 - 106	8	42
Di-n-octyl phthalate	20.0	14.7		ug/L		74	11 - 127	4	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128382/3-A
Matrix: Water
Analysis Batch: 128495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128382

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*77*		*16 - 122*
2-Fluorobiphenyl	*67*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*
Phenol-d5 (Surr)	*66*		*15 - 112*
Terphenyl-d14	*61*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128230/6
Matrix: Water
Analysis Batch: 128230

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/13/14 11:11	1

Lab Sample ID: LCS 180-128230/5
Matrix: Water
Analysis Batch: 128230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-128332/1-A
Matrix: Water
Analysis Batch: 128780

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 128332

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/15/14 10:01	12/18/14 10:52	1
Iron	ND		50	9.5	ug/L		12/15/14 10:01	12/18/14 10:52	1
Nickel	ND		10	0.51	ug/L		12/15/14 10:01	12/18/14 10:52	1
Zinc	6.05	J	10	1.0	ug/L		12/15/14 10:01	12/18/14 10:52	1

Lab Sample ID: LCS 180-128332/2-A
Matrix: Water
Analysis Batch: 128780

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 128332

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	516		ug/L		103	85 - 115
Iron	1000	1050		ug/L		105	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	504		ug/L		101	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-268955/1-A
Matrix: Water
Analysis Batch: 269017

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 268955

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		12/17/14 10:39	12/17/14 14:13	1

Lab Sample ID: LCS 500-268955/2-A
Matrix: Water
Analysis Batch: 269017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 268955

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.108		mg/L		108	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-268618/1
Matrix: Water
Analysis Batch: 268618

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/15/14 14:50	1

Lab Sample ID: LCS 500-268618/2
Matrix: Water
Analysis Batch: 268618

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	185		mg/L		92	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-268602/1
Matrix: Water
Analysis Batch: 268602

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/15/14 14:40	1

Lab Sample ID: 180-39835-1 DU
Matrix: Water
Analysis Batch: 268602

Client Sample ID: OC-FRAC 2-121214
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

GC/MS Semi VOA

Prep Batch: 128382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	3520C	
LCS 180-128382/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128382/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128382/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 128495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	8270C LL	128382
LCS 180-128382/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128382
LCSD 180-128382/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128382
MB 180-128382/1-A	Method Blank	Total/NA	Water	8270C LL	128382

HPLC/IC

Analysis Batch: 128230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	300.0	
LCS 180-128230/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128230/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 128332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total Recoverable	Water	200.7	
LCS 180-128332/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-128332/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 128780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total Recoverable	Water	200.7 Rev 4.4	128332
LCS 180-128332/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	128332
MB 180-128332/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	128332

General Chemistry

Analysis Batch: 268602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	SM 4500 Cl F	
180-39835-1 DU	OC-FRAC 2-121214	Total/NA	Water	SM 4500 Cl F	
MB 500-268602/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 268618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	SM 2540D	
LCS 500-268618/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-268618/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 268955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	Distill/Phenol	
LCS 500-268955/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-268955/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 269017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39835-1	OC-FRAC 2-121214	Total/NA	Water	420.4	268955
LCS 500-268955/2-A	Lab Control Sample	Total/NA	Water	420.4	268955
MB 500-268955/1-A	Method Blank	Total/NA	Water	420.4	268955

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Client Sample ID: OC-FRAC 2-121214
Date Collected: 12/12/14 10:00
Date Received: 12/13/14 09:15

Lab Sample ID: 180-39835-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	128382	12/15/14 14:30	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	128495	12/16/14 22:48	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL		128230	12/13/14 15:03	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	128332	12/15/14 10:01	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	128780	12/18/14 11:02	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	268955	12/17/14 10:39	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	269017	12/17/14 14:19	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	268618		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 12/15/14 15:02		
								(End) 12/15/14 15:04		
Total/NA	Analysis	SM 4500 Cl F		1			268602	12/15/14 14:41	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

CMR = Carl Reagle

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14 *
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39835-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39835-1	OC-FRAC 2-121214	Water	12/12/14 10:00	12/13/14 09:15

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chloride	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC X-2 - 121214	12-12-14	1000	G	Water			X		X	X	X	X	X		
				Water											

180-39835 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	12-12-14			12/12/14 11:00	TA
2		12/12/14 15:00	TA	Debbie Watson	12-13-14 9:15	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39835-1

Login Number: 39835

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39835-1

Login Number: 39835

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39911-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/22/2014 4:02:46 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Job ID: 180-39911-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/17/2014 10:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.5º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 128606. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Client Sample ID: OC-FRAC 4-121614

Lab Sample ID: 180-39911-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.50	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	190		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	4.1	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	2.2	J B	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	10		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Client Sample ID: OC-FRAC 4-121614
Date Collected: 12/16/14 11:00
Date Received: 12/17/14 10:00

Lab Sample ID: 180-39911-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/17/14 11:07	12/18/14 13:55	1
Butyl benzyl phthalate	**0.50**	**J**	0.94	0.13	ug/L		12/17/14 11:07	12/18/14 13:55	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/17/14 11:07	12/18/14 13:55	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/17/14 11:07	12/18/14 13:55	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/17/14 11:07	12/18/14 13:55	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/17/14 11:07	12/18/14 13:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*82*		*16 - 122*	*12/17/14 11:07*	*12/18/14 13:55*	*1*
2-Fluorobiphenyl	*62*		*19 - 107*	*12/17/14 11:07*	*12/18/14 13:55*	*1*
2-Fluorophenol (Surr)	*54*		*10 - 111*	*12/17/14 11:07*	*12/18/14 13:55*	*1*
Nitrobenzene-d5 (Surr)	*67*		*23 - 112*	*12/17/14 11:07*	*12/18/14 13:55*	*1*
Phenol-d5 (Surr)	*57*		*15 - 112*	*12/17/14 11:07*	*12/18/14 13:55*	*1*
Terphenyl-d14	*79*		*10 - 132*	*12/17/14 11:07*	*12/18/14 13:55*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**190**		5.0	0.98	mg/L			12/19/14 15:05	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.1**	**J**	10	3.0	ug/L		12/18/14 06:00	12/22/14 11:54	1
Iron	ND		50	9.5	ug/L		12/18/14 06:00	12/22/14 11:54	1
Nickel	**2.2**	**J B**	10	0.51	ug/L		12/18/14 06:00	12/22/14 11:54	1
Zinc	**10**		10	1.0	ug/L		12/18/14 06:00	12/22/14 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/19/14 13:54	12/19/14 16:17	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/18/14 09:09	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/17/14 11:40	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39911-1	OC-FRAC 4-121614	82	62	54	67	57	79		
LCS 180-128606/2-A	Lab Control Sample	71	58	69	66	71	64		
LCSD 180-128606/3-A	Lab Control Sample Dup	77	65	73	72	74	71		
MB 180-128606/1-A	Method Blank	65	57	61	62	65	59		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128606/1-A
Matrix: Water
Analysis Batch: 128734

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128606

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/17/14 11:07	12/18/14 11:38	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/17/14 11:07	12/18/14 11:38	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/17/14 11:07	12/18/14 11:38	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/17/14 11:07	12/18/14 11:38	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/17/14 11:07	12/18/14 11:38	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/17/14 11:07	12/18/14 11:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*12/17/14 11:07*	*12/18/14 11:38*	*1*
2-Fluorobiphenyl	*57*		*19 - 107*	*12/17/14 11:07*	*12/18/14 11:38*	*1*
2-Fluorophenol (Surr)	*61*		*10 - 111*	*12/17/14 11:07*	*12/18/14 11:38*	*1*
Nitrobenzene-d5 (Surr)	*62*		*23 - 112*	*12/17/14 11:07*	*12/18/14 11:38*	*1*
Phenol-d5 (Surr)	*65*		*15 - 112*	*12/17/14 11:07*	*12/18/14 11:38*	*1*
Terphenyl-d14	*59*		*10 - 132*	*12/17/14 11:07*	*12/18/14 11:38*	*1*

Lab Sample ID: LCS 180-128606/2-A
Matrix: Water
Analysis Batch: 128734

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128606

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		78	20 - 116
Butyl benzyl phthalate	20.0	15.5		ug/L		78	36 - 108
Di-n-butyl phthalate	20.0	13.6		ug/L		68	37 - 111
Diethyl phthalate	20.0	12.7		ug/L		63	36 - 109
Dimethyl phthalate	20.0	12.9		ug/L		65	37 - 106
Di-n-octyl phthalate	20.0	14.9		ug/L		75	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*16 - 122*
2-Fluorobiphenyl	*58*		*19 - 107*
2-Fluorophenol (Surr)	*69*		*10 - 111*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*
Phenol-d5 (Surr)	*71*		*15 - 112*
Terphenyl-d14	*64*		*10 - 132*

Lab Sample ID: LCSD 180-128606/3-A
Matrix: Water
Analysis Batch: 128734

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128606

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.0		ug/L		85	20 - 116	9	40
Butyl benzyl phthalate	20.0	16.8		ug/L		84	36 - 108	8	40
Di-n-butyl phthalate	20.0	14.6		ug/L		73	37 - 111	7	38
Diethyl phthalate	20.0	13.7		ug/L		69	36 - 109	8	39
Dimethyl phthalate	20.0	14.3		ug/L		72	37 - 106	10	42
Di-n-octyl phthalate	20.0	16.7		ug/L		84	11 - 127	11	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128606/3-A
Matrix: Water
Analysis Batch: 128734

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128606

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*77*		*16 - 122*
2-Fluorobiphenyl	*65*		*19 - 107*
2-Fluorophenol (Surr)	*73*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*74*		*15 - 112*
Terphenyl-d14	*71*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128792/78
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/19/14 13:16	1

Lab Sample ID: LCS 180-128792/77
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	46.4		mg/L		93	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-128688/1-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 128688

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/18/14 06:00	12/22/14 11:44	1
Iron	ND		50	9.5	ug/L		12/18/14 06:00	12/22/14 11:44	1
Nickel	0.540	J	10	0.51	ug/L		12/18/14 06:00	12/22/14 11:44	1
Zinc	ND		10	1.0	ug/L		12/18/14 06:00	12/22/14 11:44	1

Lab Sample ID: LCS 180-128688/3-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 128688

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	549		ug/L		110	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	521		ug/L		104	85 - 115
Zinc	500	513		ug/L		103	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-39911-1 MS
Matrix: Water
Analysis Batch: 129119

Client Sample ID: OC-FRAC 4-121614
Prep Type: Total Recoverable
Prep Batch: 128688

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.1	J	500	545		ug/L		108	70 - 130
Iron	ND		1000	1040		ug/L		104	70 - 130
Nickel	2.2	J B	500	526		ug/L		105	70 - 130
Zinc	10		500	511		ug/L		100	70 - 130

Lab Sample ID: 180-39911-1 MSD
Matrix: Water
Analysis Batch: 129119

Client Sample ID: OC-FRAC 4-121614
Prep Type: Total Recoverable
Prep Batch: 128688

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.1	J	500	549		ug/L		109	70 - 130	1	20
Iron	ND		1000	1030		ug/L		103	70 - 130	0	20
Nickel	2.2	J B	500	530		ug/L		106	70 - 130	1	20
Zinc	10		500	516		ug/L		101	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-269402/1-A
Matrix: Water
Analysis Batch: 269440

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 269402

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		12/19/14 13:54	12/19/14 16:07	1

Lab Sample ID: LCS 500-269402/2-A
Matrix: Water
Analysis Batch: 269440

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 269402

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0897		mg/L		90	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-269115/1
Matrix: Water
Analysis Batch: 269115

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/18/14 09:05	1

Lab Sample ID: LCS 500-269115/2
Matrix: Water
Analysis Batch: 269115

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	205	213		mg/L		104	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-268973/1
Matrix: Water
Analysis Batch: 268973

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/17/14 11:40	1

Lab Sample ID: 180-39911-1 DU
Matrix: Water
Analysis Batch: 268973

Client Sample ID: OC-FRAC 4-121614
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 128606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	3520C	
LCS 180-128606/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128606/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128606/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 128734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	8270C LL	128606
LCS 180-128606/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128606
LCSD 180-128606/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128606
MB 180-128606/1-A	Method Blank	Total/NA	Water	8270C LL	128606

HPLC/IC

Analysis Batch: 128792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	300.0	
LCS 180-128792/77	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128792/78	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 128688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total Recoverable	Water	200.7	
180-39911-1 MS	OC-FRAC 4-121614	Total Recoverable	Water	200.7	
180-39911-1 MSD	OC-FRAC 4-121614	Total Recoverable	Water	200.7	
LCS 180-128688/3-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-128688/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 129119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total Recoverable	Water	200.7 Rev 4.4	128688
180-39911-1 MS	OC-FRAC 4-121614	Total Recoverable	Water	200.7 Rev 4.4	128688
180-39911-1 MSD	OC-FRAC 4-121614	Total Recoverable	Water	200.7 Rev 4.4	128688
LCS 180-128688/3-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	128688
MB 180-128688/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	128688

General Chemistry

Analysis Batch: 268973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	SM 4500 Cl F	
180-39911-1 DU	OC-FRAC 4-121614	Total/NA	Water	SM 4500 Cl F	
MB 500-268973/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 269115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	SM 2540D	
LCS 500-269115/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 269115 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-269115/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 269402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	Distill/Phenol	
LCS 500-269402/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-269402/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 269440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39911-1	OC-FRAC 4-121614	Total/NA	Water	420.4	269402
LCS 500-269402/2-A	Lab Control Sample	Total/NA	Water	420.4	269402
MB 500-269402/1-A	Method Blank	Total/NA	Water	420.4	269402

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Client Sample ID: OC-FRAC 4-121614
Date Collected: 12/16/14 11:00
Date Received: 12/17/14 10:00

Lab Sample ID: 180-39911-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	128606	12/17/14 11:07	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	128734	12/18/14 13:55	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		128792	12/19/14 15:05	MJH	TAL PIT
	Instrument ID: CHIC25									
Total Recoverable	Prep	200.7			50 mL	50 mL	128688	12/18/14 06:00	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129119	12/22/14 11:54	RJG	TAL PIT
	Instrument ID: Q									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	269402	12/19/14 13:54	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	269440	12/19/14 16:17	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	269115		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 12/18/14 09:09		
								(End) 12/18/14 09:11		
Total/NA	Analysis	SM 4500 Cl F		1			268973	12/17/14 11:40	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39911-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39911-1	OC-FRAC 4-121614	Water	12/16/14 11:00	12/17/14 10:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custo

180-39911 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNa02
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC4- 121614	12-16-14	1100	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	12-16-14 1145		[signature]	12-16-14 1145	TR
[signature]	12-16-14 1200		Bellvie Watson	12-16-14 DW	TAP
				12-16-14 DW	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		12-17-14 10:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39911-1

Login Number: 39911

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39911-1

Login Number: 39911

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39945-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/23/2014 3:23:18 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Job ID: 180-39945-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/18/2014 9:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS Semi VOA
Method 8270C LL: The method blank for batch 128841 contained Diethyphehalate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 128841. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Client Sample ID: OC-FRAC 3-121714

Lab Sample ID: 180-39945-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	180		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.3	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.5	J B	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	11		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Client Sample ID: OC-FRAC 3-121714
Date Collected: 12/17/14 10:00
Date Received: 12/18/14 09:40

Lab Sample ID: 180-39945-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/19/14 08:50	12/22/14 13:59	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		12/19/14 08:50	12/22/14 13:59	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/19/14 08:50	12/22/14 13:59	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/19/14 08:50	12/22/14 13:59	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/19/14 08:50	12/22/14 13:59	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/19/14 08:50	12/22/14 13:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*42*		*16 - 122*	*12/19/14 08:50*	*12/22/14 13:59*	*1*
2-Fluorobiphenyl	*40*		*19 - 107*	*12/19/14 08:50*	*12/22/14 13:59*	*1*
2-Fluorophenol (Surr)	*41*		*10 - 111*	*12/19/14 08:50*	*12/22/14 13:59*	*1*
Nitrobenzene-d5 (Surr)	*45*		*23 - 112*	*12/19/14 08:50*	*12/22/14 13:59*	*1*
Phenol-d5 (Surr)	*48*		*15 - 112*	*12/19/14 08:50*	*12/22/14 13:59*	*1*
Terphenyl-d14	*44*		*10 - 132*	*12/19/14 08:50*	*12/22/14 13:59*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**180**		5.0	0.98	mg/L			12/19/14 09:07	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.3**	**J**	10	3.0	ug/L		12/21/14 06:47	12/22/14 09:24	1
Iron	ND		50	9.5	ug/L		12/21/14 06:47	12/22/14 09:24	1
Nickel	**1.5**	**J B**	10	0.51	ug/L		12/21/14 06:47	12/22/14 09:24	1
Zinc	**11**		10	1.0	ug/L		12/21/14 06:47	12/22/14 09:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		12/22/14 09:30	12/22/14 12:39	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/19/14 09:44	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/18/14 14:01	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39945-1	OC-FRAC 3-121714	42	40	41	45	48	44		
LCS 180-128841/2-A	Lab Control Sample	105	70	71	77	78	72		
LCSD 180-128841/3-A	Lab Control Sample Dup	106	72	72	78	81	77		
MB 180-128841/1-A	Method Blank	84	67	67	74	77	72		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128841/1-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128841

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/19/14 08:50	12/22/14 09:17	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/19/14 08:50	12/22/14 09:17	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/19/14 08:50	12/22/14 09:17	1
Diethyl phthalate	0.236	J	1.0	0.15	ug/L		12/19/14 08:50	12/22/14 09:17	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/19/14 08:50	12/22/14 09:17	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/19/14 08:50	12/22/14 09:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*84*		*16 - 122*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
2-Fluorobiphenyl	*67*		*19 - 107*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
2-Fluorophenol (Surr)	*67*		*10 - 111*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Phenol-d5 (Surr)	*77*		*15 - 112*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Terphenyl-d14	*72*		*10 - 132*	*12/19/14 08:50*	*12/22/14 09:17*	*1*

Lab Sample ID: LCS 180-128841/2-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128841

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.2		ug/L		81	20 - 116
Butyl benzyl phthalate	20.0	15.8		ug/L		79	36 - 108
Di-n-butyl phthalate	20.0	16.8		ug/L		84	37 - 111
Diethyl phthalate	20.0	14.8		ug/L		74	36 - 109
Dimethyl phthalate	20.0	16.7		ug/L		83	37 - 106
Di-n-octyl phthalate	20.0	16.3		ug/L		82	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*105*		*16 - 122*
2-Fluorobiphenyl	*70*		*19 - 107*
2-Fluorophenol (Surr)	*71*		*10 - 111*
Nitrobenzene-d5 (Surr)	*77*		*23 - 112*
Phenol-d5 (Surr)	*78*		*15 - 112*
Terphenyl-d14	*72*		*10 - 132*

Lab Sample ID: LCSD 180-128841/3-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128841

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.4		ug/L		87	20 - 116	7	40
Butyl benzyl phthalate	20.0	17.1		ug/L		86	36 - 108	8	40
Di-n-butyl phthalate	20.0	18.1		ug/L		91	37 - 111	8	38
Diethyl phthalate	20.0	15.6		ug/L		78	36 - 109	5	39
Dimethyl phthalate	20.0	17.5		ug/L		87	37 - 106	5	42
Di-n-octyl phthalate	20.0	17.7		ug/L		88	11 - 127	8	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128841/3-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128841

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*106*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*78*		*23 - 112*
Phenol-d5 (Surr)	*81*		*15 - 112*
Terphenyl-d14	*77*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128792/34
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/18/14 23:49	1

Lab Sample ID: LCS 180-128792/33
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.7		mg/L		95	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-128963/1-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 128963

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/21/14 06:47	12/22/14 09:14	1
Iron	ND		50	9.5	ug/L		12/21/14 06:47	12/22/14 09:14	1
Nickel	0.900	J	10	0.51	ug/L		12/21/14 06:47	12/22/14 09:14	1
Zinc	ND		10	1.0	ug/L		12/21/14 06:47	12/22/14 09:14	1

Lab Sample ID: LCS 180-128963/2-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 128963

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	522		ug/L		104	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	508		ug/L		102	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-39945-1 MS — **Client Sample ID: OC-FRAC 3-121714**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129119 — **Prep Batch: 128963**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.3	J	500	543		ug/L		108	70 - 130
Iron	ND		1000	1010		ug/L		101	70 - 130
Nickel	1.5	J B	500	514		ug/L		102	70 - 130
Zinc	11		500	514		ug/L		101	70 - 130

Lab Sample ID: 180-39945-1 MSD — **Client Sample ID: OC-FRAC 3-121714**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129119 — **Prep Batch: 128963**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.3	J	500	519		ug/L		103	70 - 130	4	20
Iron	ND		1000	1020		ug/L		102	70 - 130	1	20
Nickel	1.5	J B	500	501		ug/L		100	70 - 130	2	20
Zinc	11		500	505		ug/L		99	70 - 130	2	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-269607/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 269684 — **Prep Batch: 269607**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.00265	J	0.0051	0.0022	mg/L		12/22/14 09:30	12/22/14 12:37	1

Lab Sample ID: LCS 500-269607/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 269684 — **Prep Batch: 269607**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0999		mg/L		100	90 - 110

Lab Sample ID: 180-39945-1 MS — **Client Sample ID: OC-FRAC 3-121714**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 269684 — **Prep Batch: 269607**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.105		mg/L		105	75 - 125

Lab Sample ID: 180-39945-1 MSD — **Client Sample ID: OC-FRAC 3-121714**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 269684 — **Prep Batch: 269607**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.100		mg/L		100	75 - 125	4	20

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-269363/1
Matrix: Water
Analysis Batch: 269363

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/19/14 09:40	1

Lab Sample ID: LCS 500-269363/2
Matrix: Water
Analysis Batch: 269363

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	193		mg/L		96	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-269190/1
Matrix: Water
Analysis Batch: 269190

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/18/14 14:00	1

GC/MS Semi VOA

Prep Batch: 128841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	3520C	
LCS 180-128841/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128841/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128841/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 128996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	8270C LL	128841
LCS 180-128841/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128841
LCSD 180-128841/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128841
MB 180-128841/1-A	Method Blank	Total/NA	Water	8270C LL	128841

HPLC/IC

Analysis Batch: 128792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	300.0	
LCS 180-128792/33	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128792/34	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 128963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total Recoverable	Water	200.7	
180-39945-1 MS	OC-FRAC 3-121714	Total Recoverable	Water	200.7	
180-39945-1 MSD	OC-FRAC 3-121714	Total Recoverable	Water	200.7	
LCS 180-128963/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-128963/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 129119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total Recoverable	Water	200.7 Rev 4.4	128963
180-39945-1 MS	OC-FRAC 3-121714	Total Recoverable	Water	200.7 Rev 4.4	128963
180-39945-1 MSD	OC-FRAC 3-121714	Total Recoverable	Water	200.7 Rev 4.4	128963
LCS 180-128963/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	128963
MB 180-128963/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	128963

General Chemistry

Analysis Batch: 269190

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	SM 4500 Cl F	
MB 500-269190/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 269363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	SM 2540D	
LCS 500-269363/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-269363/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 269607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	Distill/Phenol	
180-39945-1 MS	OC-FRAC 3-121714	Total/NA	Water	Distill/Phenol	
180-39945-1 MSD	OC-FRAC 3-121714	Total/NA	Water	Distill/Phenol	
LCS 500-269607/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-269607/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 269684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39945-1	OC-FRAC 3-121714	Total/NA	Water	420.4	269607
180-39945-1 MS	OC-FRAC 3-121714	Total/NA	Water	420.4	269607
180-39945-1 MSD	OC-FRAC 3-121714	Total/NA	Water	420.4	269607
LCS 500-269607/2-A	Lab Control Sample	Total/NA	Water	420.4	269607
MB 500-269607/1-A	Method Blank	Total/NA	Water	420.4	269607

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Client Sample ID: OC-FRAC 3-121714
Date Collected: 12/17/14 10:00
Date Received: 12/18/14 09:40

Lab Sample ID: 180-39945-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	128841	12/19/14 08:50	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	128996	12/22/14 13:59	SAB	TAL PIT
		Instrument ID: CH722								
Total/NA	Analysis	300.0		5	1 mL		128792	12/19/14 09:07	MJH	TAL PIT
		Instrument ID: CHIC25								
Total Recoverable	Prep	200.7			50 mL	50 mL	128963	12/21/14 06:47	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129119	12/22/14 09:24	RJG	TAL PIT
		Instrument ID: Q								
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	269607	12/22/14 09:30	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	269684	12/22/14 12:39	AJR	TAL CHI
		Instrument ID: SEAL2								
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	269363		SMO	TAL CHI
		Instrument ID: NOEQUIP						(Start) 12/19/14 09:44		
								(End) 12/19/14 09:46		
Total/NA	Analysis	SM 4500 Cl F		1			269190	12/18/14 14:01	MTB	TAL CHI
		Instrument ID: NOEQUIP								

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39945-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39945-1	OC-FRAC 3-121714	Water	12/17/14 10:00	12/18/14 09:40

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Cu

180-39945 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNa02, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
Frac3 - 121714	12-17-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	12-17-14			12-17-14 1130	
2		12-17-14 1700		Debbie Watson	12-18-14	
3		Date/Time:	Company	Received by:	Date/Time: 9:40	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39945-1

Login Number: 39945

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39945-1

Login Number: 39945

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-39947-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/23/2014 3:27:05 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-39947-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-39947-1

Comments
No additional comments.

Receipt
The sample was received on 12/18/2014 9:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS Semi VOA
Method(s) 8270C LL: The method blank for batch 128841 contained Diethyphehalate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch <<128841>>. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Client Sample ID: OC- INF 121714

Lab Sample ID: 180-39947-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	19		1.9	1.2	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.15	J B	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	120		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	14		10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	7600		50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.6	J B	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	4.1	J	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.0049	J B	0.0051	0.0022	mg/L	1		420.4	Total/NA
Total Suspended Solids	2.5	J	5.0	1.6	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Client Sample ID: OC- INF 121714
Date Collected: 12/17/14 10:00
Date Received: 12/18/14 09:40

Lab Sample ID: 180-39947-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**19**		1.9	1.2	ug/L		12/19/14 08:51	12/22/14 11:08	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		12/19/14 08:51	12/22/14 11:08	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		12/19/14 08:51	12/22/14 11:08	1
Diethyl phthalate	**0.15**	**J B**	0.95	0.14	ug/L		12/19/14 08:51	12/22/14 11:08	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		12/19/14 08:51	12/22/14 11:08	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		12/19/14 08:51	12/22/14 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*118*		*16 - 122*	*12/19/14 08:51*	*12/22/14 11:08*	*1*
2-Fluorobiphenyl	*75*		*19 - 107*	*12/19/14 08:51*	*12/22/14 11:08*	*1*
2-Fluorophenol (Surr)	*70*		*10 - 111*	*12/19/14 08:51*	*12/22/14 11:08*	*1*
Nitrobenzene-d5 (Surr)	*82*		*23 - 112*	*12/19/14 08:51*	*12/22/14 11:08*	*1*
Phenol-d5 (Surr)	*82*		*15 - 112*	*12/19/14 08:51*	*12/22/14 11:08*	*1*
Terphenyl-d14	*74*		*10 - 132*	*12/19/14 08:51*	*12/22/14 11:08*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**120**		5.0	0.98	mg/L			12/19/14 09:23	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**14**		10	3.0	ug/L		12/21/14 06:47	12/22/14 09:46	1
Iron	**7600**		50	9.5	ug/L		12/21/14 06:47	12/22/14 09:46	1
Nickel	**1.6**	**J B**	10	0.51	ug/L		12/21/14 06:47	12/22/14 09:46	1
Zinc	**4.1**	**J**	10	1.0	ug/L		12/21/14 06:47	12/22/14 09:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0049**	**J B**	0.0051	0.0022	mg/L		12/22/14 09:30	12/22/14 12:42	1
Total Suspended Solids	**2.5**	**J**	5.0	1.6	mg/L			12/19/14 09:46	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/18/14 14:02	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-39947-1	OC- INF 121714	118	75	70	82	82	74		
LCS 180-128841/2-A	Lab Control Sample	105	70	71	77	78	72		
LCSD 180-128841/3-A	Lab Control Sample Dup	106	72	72	78	81	77		
MB 180-128841/1-A	Method Blank	84	67	67	74	77	72		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128841/1-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128841

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/19/14 08:50	12/22/14 09:17	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/19/14 08:50	12/22/14 09:17	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/19/14 08:50	12/22/14 09:17	1
Diethyl phthalate	0.236	J	1.0	0.15	ug/L		12/19/14 08:50	12/22/14 09:17	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/19/14 08:50	12/22/14 09:17	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/19/14 08:50	12/22/14 09:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*84*		*16 - 122*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
2-Fluorobiphenyl	*67*		*19 - 107*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
2-Fluorophenol (Surr)	*67*		*10 - 111*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Phenol-d5 (Surr)	*77*		*15 - 112*	*12/19/14 08:50*	*12/22/14 09:17*	*1*
Terphenyl-d14	*72*		*10 - 132*	*12/19/14 08:50*	*12/22/14 09:17*	*1*

Lab Sample ID: LCS 180-128841/2-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128841

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.2		ug/L		81	20 - 116
Butyl benzyl phthalate	20.0	15.8		ug/L		79	36 - 108
Di-n-butyl phthalate	20.0	16.8		ug/L		84	37 - 111
Diethyl phthalate	20.0	14.8		ug/L		74	36 - 109
Dimethyl phthalate	20.0	16.7		ug/L		83	37 - 106
Di-n-octyl phthalate	20.0	16.3		ug/L		82	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*105*		*16 - 122*
2-Fluorobiphenyl	*70*		*19 - 107*
2-Fluorophenol (Surr)	*71*		*10 - 111*
Nitrobenzene-d5 (Surr)	*77*		*23 - 112*
Phenol-d5 (Surr)	*78*		*15 - 112*
Terphenyl-d14	*72*		*10 - 132*

Lab Sample ID: LCSD 180-128841/3-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128841

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.4		ug/L		87	20 - 116	7	40
Butyl benzyl phthalate	20.0	17.1		ug/L		86	36 - 108	8	40
Di-n-butyl phthalate	20.0	18.1		ug/L		91	37 - 111	8	38
Diethyl phthalate	20.0	15.6		ug/L		78	36 - 109	5	39
Dimethyl phthalate	20.0	17.5		ug/L		87	37 - 106	5	42
Di-n-octyl phthalate	20.0	17.7		ug/L		88	11 - 127	8	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128841/3-A
Matrix: Water
Analysis Batch: 128996

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128841

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*106*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*78*		*23 - 112*
Phenol-d5 (Surr)	*81*		*15 - 112*
Terphenyl-d14	*77*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128792/34
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/18/14 23:49	1

Lab Sample ID: LCS 180-128792/33
Matrix: Water
Analysis Batch: 128792

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.7		mg/L		95	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-128963/1-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 128963

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/21/14 06:47	12/22/14 09:14	1
Iron	ND		50	9.5	ug/L		12/21/14 06:47	12/22/14 09:14	1
Nickel	0.900	J	10	0.51	ug/L		12/21/14 06:47	12/22/14 09:14	1
Zinc	ND		10	1.0	ug/L		12/21/14 06:47	12/22/14 09:14	1

Lab Sample ID: LCS 180-128963/2-A
Matrix: Water
Analysis Batch: 129119

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 128963

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	522		ug/L		104	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	508		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-269607/1-A
Matrix: Water
Analysis Batch: 269684

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 269607

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.00265	J	0.0051	0.0022	mg/L		12/22/14 09:30	12/22/14 12:37	1

Lab Sample ID: LCS 500-269607/2-A
Matrix: Water
Analysis Batch: 269684

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 269607

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0999		mg/L		100	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-269363/1
Matrix: Water
Analysis Batch: 269363

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/19/14 09:40	1

Lab Sample ID: LCS 500-269363/2
Matrix: Water
Analysis Batch: 269363

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	193		mg/L		96	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-269190/1
Matrix: Water
Analysis Batch: 269190

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/18/14 14:00	1

Lab Sample ID: 180-39947-1 DU
Matrix: Water
Analysis Batch: 269190

Client Sample ID: OC- INF 121714
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

GC/MS Semi VOA

Prep Batch: 128841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	3520C	
LCS 180-128841/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128841/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128841/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 128996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	8270C LL	128841
LCS 180-128841/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128841
LCSD 180-128841/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128841
MB 180-128841/1-A	Method Blank	Total/NA	Water	8270C LL	128841

HPLC/IC

Analysis Batch: 128792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	300.0	
LCS 180-128792/33	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128792/34	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 128963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total Recoverable	Water	200.7	
LCS 180-128963/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-128963/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 129119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total Recoverable	Water	200.7 Rev 4.4	128963
LCS 180-128963/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	128963
MB 180-128963/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	128963

General Chemistry

Analysis Batch: 269190

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	SM 4500 Cl F	
180-39947-1 DU	OC- INF 121714	Total/NA	Water	SM 4500 Cl F	
MB 500-269190/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 269363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	SM 2540D	
LCS 500-269363/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-269363/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 269607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	Distill/Phenol	
LCS 500-269607/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-269607/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 269684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-39947-1	OC- INF 121714	Total/NA	Water	420.4	269607
LCS 500-269607/2-A	Lab Control Sample	Total/NA	Water	420.4	269607
MB 500-269607/1-A	Method Blank	Total/NA	Water	420.4	269607

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Client Sample ID: OC- INF 121714
Date Collected: 12/17/14 10:00
Date Received: 12/18/14 09:40

Lab Sample ID: 180-39947-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1050 mL	1.0 mL	128841	12/19/14 08:51	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1050 mL	1.0 mL	128996	12/22/14 11:08	SAB	TAL PIT
	Instrument ID: CH722									
Total/NA	Analysis	300.0		5	1 mL		128792	12/19/14 09:23	MJH	TAL PIT
	Instrument ID: CHIC25									
Total Recoverable	Prep	200.7			50 mL	50 mL	128963	12/21/14 06:47	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129119	12/22/14 09:46	RJG	TAL PIT
	Instrument ID: Q									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	269607	12/22/14 09:30	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	269684	12/22/14 12:42	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	269363		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 12/19/14 09:46		
								(End) 12/19/14 09:49		
Total/NA	Analysis	SM 4500 Cl F		1			269190	12/18/14 14:02	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-39947-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-39947-1	OC- INF 121714	Water	12/17/14 10:00	12/18/14 09:40

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: MA, 01887				
Phone: 978.658.6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

180-39947 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastestel, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
Inf 121714	12-17-14	1000	G	Water			X		X	X	X	X	X		
				Water											

4500-Cl
200.7
8270
WENT TO Pittsburgh
THE REST TO Chicago.

Page 17 of 19

Possible Hazard Identification	Sample Disposal (A fee may be assessed if sam
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of S
Relinquished by: L Johnson	Date/Time: 12-17-14	Company	Received by:	Date/Time: 12-17-14 1130	Company
Relinquished by:	Date/Time: 12-17-14 1200	Company	Received by:	Date/Time: 12-18-14	Company
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 9:40	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

123201

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39947-1

Login Number: 39947

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-39947-1

Login Number: 39947

List Source: TestAmerica Pittsburgh

List Number: 2

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-40043-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/30/2014 8:52:03 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Job ID: 180-40043-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/20/2014 10:20 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.0º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 128990. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Client Sample ID: FRAC 5-121914

Lab Sample ID: 180-40043-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.42	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	180		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.4	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.78	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	16	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Client Sample ID: FRAC 5-121914
Date Collected: 12/19/14 10:00
Date Received: 12/20/14 10:20

Lab Sample ID: 180-40043-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/21/14 16:45	12/23/14 08:38	1
Butyl benzyl phthalate	**0.42**	**J**	0.94	0.13	ug/L		12/21/14 16:45	12/23/14 08:38	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/21/14 16:45	12/23/14 08:38	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/21/14 16:45	12/23/14 08:38	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/21/14 16:45	12/23/14 08:38	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/21/14 16:45	12/23/14 08:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*	*12/21/14 16:45*	*12/23/14 08:38*	*1*
2-Fluorobiphenyl	*56*		*19 - 107*	*12/21/14 16:45*	*12/23/14 08:38*	*1*
2-Fluorophenol (Surr)	*59*		*10 - 111*	*12/21/14 16:45*	*12/23/14 08:38*	*1*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*	*12/21/14 16:45*	*12/23/14 08:38*	*1*
Phenol-d5 (Surr)	*65*		*15 - 112*	*12/21/14 16:45*	*12/23/14 08:38*	*1*
Terphenyl-d14	*65*		*10 - 132*	*12/21/14 16:45*	*12/23/14 08:38*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**180**		5.0	0.98	mg/L			12/20/14 17:12	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.4**	**J**	10	3.0	ug/L		12/23/14 04:54	12/29/14 11:35	1
Iron	ND		50	9.5	ug/L		12/23/14 04:54	12/29/14 11:35	1
Nickel	**0.78**	**J**	10	0.51	ug/L		12/23/14 04:54	12/29/14 11:35	1
Zinc	**16**	**B**	10	1.0	ug/L		12/23/14 04:54	12/29/14 11:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		12/24/14 10:07	12/24/14 14:58	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/22/14 10:06	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/21/14 14:41	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40043-1	FRAC 5-121914	76	56	59	66	65	65		
LCS 180-128990/2-A	Lab Control Sample	79	50	57	59	63	57		
LCSD 180-128990/3-A	Lab Control Sample Dup	77	47	52	53	57	54		
MB 180-128990/1-A	Method Blank	89	61	62	70	71	68		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-128990/1-A
Matrix: Water
Analysis Batch: 129148

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 128990

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/21/14 16:45	12/23/14 04:52	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/21/14 16:45	12/23/14 04:52	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/21/14 16:45	12/23/14 04:52	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/21/14 16:45	12/23/14 04:52	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/21/14 16:45	12/23/14 04:52	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/21/14 16:45	12/23/14 04:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*89*		*16 - 122*	*12/21/14 16:45*	*12/23/14 04:52*	*1*
2-Fluorobiphenyl	*61*		*19 - 107*	*12/21/14 16:45*	*12/23/14 04:52*	*1*
2-Fluorophenol (Surr)	*62*		*10 - 111*	*12/21/14 16:45*	*12/23/14 04:52*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*12/21/14 16:45*	*12/23/14 04:52*	*1*
Phenol-d5 (Surr)	*71*		*15 - 112*	*12/21/14 16:45*	*12/23/14 04:52*	*1*
Terphenyl-d14	*68*		*10 - 132*	*12/21/14 16:45*	*12/23/14 04:52*	*1*

Lab Sample ID: LCS 180-128990/2-A
Matrix: Water
Analysis Batch: 129148

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 128990

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	11.1		ug/L		56	20 - 116
Butyl benzyl phthalate	20.0	11.4		ug/L		57	36 - 108
Di-n-butyl phthalate	20.0	11.3		ug/L		56	37 - 111
Diethyl phthalate	20.0	10.1		ug/L		50	36 - 109
Dimethyl phthalate	20.0	11.8		ug/L		59	37 - 106
Di-n-octyl phthalate	20.0	11.6		ug/L		58	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*79*		*16 - 122*
2-Fluorobiphenyl	*50*		*19 - 107*
2-Fluorophenol (Surr)	*57*		*10 - 111*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*
Phenol-d5 (Surr)	*63*		*15 - 112*
Terphenyl-d14	*57*		*10 - 132*

Lab Sample ID: LCSD 180-128990/3-A
Matrix: Water
Analysis Batch: 129148

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128990

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	11.0		ug/L		55	20 - 116	1	40
Butyl benzyl phthalate	20.0	11.4		ug/L		57	36 - 108	0	40
Di-n-butyl phthalate	20.0	11.6		ug/L		58	37 - 111	2	38
Diethyl phthalate	20.0	10.0		ug/L		50	36 - 109	1	39
Dimethyl phthalate	20.0	11.7		ug/L		58	37 - 106	1	42
Di-n-octyl phthalate	20.0	11.5		ug/L		58	11 - 127	0	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-128990/3-A
Matrix: Water
Analysis Batch: 129148

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 128990

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*77*		*16 - 122*
2-Fluorobiphenyl	*47*		*19 - 107*
2-Fluorophenol (Surr)	*52*		*10 - 111*
Nitrobenzene-d5 (Surr)	*53*		*23 - 112*
Phenol-d5 (Surr)	*57*		*15 - 112*
Terphenyl-d14	*54*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-128960/6
Matrix: Water
Analysis Batch: 128960

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/20/14 15:03	1

Lab Sample ID: LCS 180-128960/5
Matrix: Water
Analysis Batch: 128960

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.7		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-129157/1-A
Matrix: Water
Analysis Batch: 129494

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 129157

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/23/14 04:54	12/29/14 11:24	1
Iron	ND		50	9.5	ug/L		12/23/14 04:54	12/29/14 11:24	1
Nickel	ND		10	0.51	ug/L		12/23/14 04:54	12/29/14 11:24	1
Zinc	3.08	J	10	1.0	ug/L		12/23/14 04:54	12/29/14 11:24	1

Lab Sample ID: LCS 180-129157/2-A
Matrix: Water
Analysis Batch: 129494

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 129157

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	551		ug/L		110	85 - 115
Iron	1000	1140		ug/L		114	85 - 115
Nickel	500	527		ug/L		105	85 - 115
Zinc	500	533		ug/L		107	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-40043-1 MS
Matrix: Water
Analysis Batch: 129494

Client Sample ID: FRAC 5-121914
Prep Type: Total Recoverable
Prep Batch: 129157

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.4	J	500	561		ug/L		112	70 - 130
Iron	ND		1000	1080		ug/L		108	70 - 130
Nickel	0.78	J	500	527		ug/L		105	70 - 130
Zinc	16	B	500	533		ug/L		103	70 - 130

Lab Sample ID: 180-40043-1 MSD
Matrix: Water
Analysis Batch: 129494

Client Sample ID: FRAC 5-121914
Prep Type: Total Recoverable
Prep Batch: 129157

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.4	J	500	562		ug/L		112	70 - 130	0	20
Iron	ND		1000	1110		ug/L		111	70 - 130	3	20
Nickel	0.78	J	500	531		ug/L		106	70 - 130	1	20
Zinc	16	B	500	539		ug/L		105	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-270008/1-A
Matrix: Water
Analysis Batch: 270066

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 270008

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		12/24/14 10:07	12/24/14 14:50	1

Lab Sample ID: LCS 500-270008/2-A
Matrix: Water
Analysis Batch: 270066

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 270008

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0984		mg/L		98	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-269629/1
Matrix: Water
Analysis Batch: 269629

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/22/14 09:30	1

Lab Sample ID: LCS 500-269629/2
Matrix: Water
Analysis Batch: 269629

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	218		mg/L		109	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-269552/1
Matrix: Water
Analysis Batch: 269552

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/21/14 14:40	1

Lab Sample ID: 180-40043-1 DU
Matrix: Water
Analysis Batch: 269552

Client Sample ID: FRAC 5-121914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 128990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	3520C	
LCS 180-128990/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-128990/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-128990/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 129148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	8270C LL	128990
LCS 180-128990/2-A	Lab Control Sample	Total/NA	Water	8270C LL	128990
LCSD 180-128990/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	128990
MB 180-128990/1-A	Method Blank	Total/NA	Water	8270C LL	128990

HPLC/IC

Analysis Batch: 128960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	300.0	
LCS 180-128960/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-128960/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 129157

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total Recoverable	Water	200.7	
180-40043-1 MS	FRAC 5-121914	Total Recoverable	Water	200.7	
180-40043-1 MSD	FRAC 5-121914	Total Recoverable	Water	200.7	
LCS 180-129157/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-129157/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 129494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total Recoverable	Water	200.7 Rev 4.4	129157
180-40043-1 MS	FRAC 5-121914	Total Recoverable	Water	200.7 Rev 4.4	129157
180-40043-1 MSD	FRAC 5-121914	Total Recoverable	Water	200.7 Rev 4.4	129157
LCS 180-129157/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	129157
MB 180-129157/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	129157

General Chemistry

Analysis Batch: 269552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	SM 4500 Cl F	
180-40043-1 DU	FRAC 5-121914	Total/NA	Water	SM 4500 Cl F	
MB 500-269552/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 269629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	SM 2540D	
LCS 500-269629/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 269629 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-269629/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 270008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	Distill/Phenol	
LCS 500-270008/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-270008/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 270066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40043-1	FRAC 5-121914	Total/NA	Water	420.4	270008
LCS 500-270008/2-A	Lab Control Sample	Total/NA	Water	420.4	270008
MB 500-270008/1-A	Method Blank	Total/NA	Water	420.4	270008

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Client Sample ID: FRAC 5-121914
Date Collected: 12/19/14 10:00
Date Received: 12/20/14 10:20

Lab Sample ID: 180-40043-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	128990	12/21/14 16:45	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	129148	12/23/14 08:38	FBB	TAL PIT
	Instrument ID: CH722									
Total/NA	Analysis	300.0		5	1 mL		128960	12/20/14 17:12	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	129157	12/23/14 04:54	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129494	12/29/14 11:35	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	102 mL	270008	12/24/14 10:07	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	102 mL	270066	12/24/14 14:58	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	269629		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	12/22/14 10:06		
							(End)	12/22/14 10:09		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	269552	12/21/14 14:41	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

FBB = Frank Bungard

MJH = Matthew Hartman

RJR = Ron Rosenbaum

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-14 *
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-14 *
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40043-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40043-1	FRAC 5-121914	Water	12/19/14 10:00	12/20/14 10:20

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custc

180-40043 Chain of Custody

TestAmerica

COC No: 180-41314-10069.1
Page: Page 1 of 1
Job #:

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testa
Company: Olin Corporation		
Address: 51 Eames street	Due Date Requested:	
City: Wilmington	TAT Requested (days): A.S.A.P.	
State, Zip: MA, 01887		
Phone: 978-658-6121	PO #: REWI0020	
Email: beguichard@olin.com	WO #:	
Project Name: Wilmington Plant B RPG	Project #: 48006853	
Site:	SSOW#:	

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_CL_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	S	N	N		
FRAC 5 - 121914	12-19-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 12.19.14	Company	Received by:	Date/Time: 12/19/14 13:30	Company TA
Relinquished by:	Date/Time: 12/19/14 16:00	Company TA	Received by: Deliver Boston	Date/Time: 12-20-14	Company DAP
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 10:20	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40043-1

Login Number: 40043

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40043-1

Login Number: 40043

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40119-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
12/31/2014 2:59:15 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Job ID: 180-40119-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 12/24/2014 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.6º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 129469. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Client Sample ID: OC-FRAC 1-122314

Lab Sample ID: 180-40119-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.41	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	180		5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	1.2	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	21	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.0055		0.0052	0.0023	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Client Sample ID: OC-FRAC 1-122314
Date Collected: 12/23/14 11:00
Date Received: 12/24/14 10:10

Lab Sample ID: 180-40119-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		12/29/14 11:39	12/30/14 19:46	1
Butyl benzyl phthalate	**0.41**	**J**	0.94	0.13	ug/L		12/29/14 11:39	12/30/14 19:46	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		12/29/14 11:39	12/30/14 19:46	1
Diethyl phthalate	ND		0.94	0.14	ug/L		12/29/14 11:39	12/30/14 19:46	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		12/29/14 11:39	12/30/14 19:46	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		12/29/14 11:39	12/30/14 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*12/29/14 11:39*	*12/30/14 19:46*	*1*
2-Fluorobiphenyl	*54*		*19 - 107*	*12/29/14 11:39*	*12/30/14 19:46*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 111*	*12/29/14 11:39*	*12/30/14 19:46*	*1*
Nitrobenzene-d5 (Surr)	*58*		*23 - 112*	*12/29/14 11:39*	*12/30/14 19:46*	*1*
Phenol-d5 (Surr)	*54*		*15 - 112*	*12/29/14 11:39*	*12/30/14 19:46*	*1*
Terphenyl-d14	*60*		*10 - 132*	*12/29/14 11:39*	*12/30/14 19:46*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**180**		5.0	0.98	mg/L			12/24/14 19:07	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/29/14 06:56	12/31/14 12:38	1
Iron	ND		50	9.5	ug/L		12/29/14 06:56	12/31/14 09:19	1
Nickel	**1.2**	**J**	10	0.51	ug/L		12/29/14 06:56	12/31/14 12:38	1
Zinc	**21**	**B**	10	1.0	ug/L		12/29/14 06:56	12/31/14 12:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0055**		0.0052	0.0023	mg/L		12/29/14 11:09	12/29/14 14:04	1
Total Suspended Solids	ND		5.0	1.6	mg/L			12/26/14 13:41	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			12/24/14 15:26	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40119-1	OC-FRAC 1-122314	60	54	49	58	54	60		
LCS 180-129469/2-A	Lab Control Sample	71	64	73	69	74	63		
LCSD 180-129469/3-A	Lab Control Sample Dup	73	65	74	71	74	63		
MB 180-129469/1-A	Method Blank	65	60	62	64	65	61		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-129469/1-A
Matrix: Water
Analysis Batch: 129601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 129469

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		12/29/14 11:39	12/30/14 13:30	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		12/29/14 11:39	12/30/14 13:30	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		12/29/14 11:39	12/30/14 13:30	1
Diethyl phthalate	ND		1.0	0.15	ug/L		12/29/14 11:39	12/30/14 13:30	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		12/29/14 11:39	12/30/14 13:30	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		12/29/14 11:39	12/30/14 13:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*12/29/14 11:39*	*12/30/14 13:30*	*1*
2-Fluorobiphenyl	*60*		*19 - 107*	*12/29/14 11:39*	*12/30/14 13:30*	*1*
2-Fluorophenol (Surr)	*62*		*10 - 111*	*12/29/14 11:39*	*12/30/14 13:30*	*1*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*	*12/29/14 11:39*	*12/30/14 13:30*	*1*
Phenol-d5 (Surr)	*65*		*15 - 112*	*12/29/14 11:39*	*12/30/14 13:30*	*1*
Terphenyl-d14	*61*		*10 - 132*	*12/29/14 11:39*	*12/30/14 13:30*	*1*

Lab Sample ID: LCS 180-129469/2-A
Matrix: Water
Analysis Batch: 129601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 129469

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.1		ug/L		76	20 - 116
Butyl benzyl phthalate	20.0	14.7		ug/L		74	36 - 108
Di-n-butyl phthalate	20.0	13.7		ug/L		69	37 - 111
Diethyl phthalate	20.0	12.7		ug/L		64	36 - 109
Dimethyl phthalate	20.0	13.1		ug/L		65	37 - 106
Di-n-octyl phthalate	20.0	14.0		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*73*		*10 - 111*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*
Phenol-d5 (Surr)	*74*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Lab Sample ID: LCSD 180-129469/3-A
Matrix: Water
Analysis Batch: 129601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 129469

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		76	20 - 116	1	40
Butyl benzyl phthalate	20.0	15.0		ug/L		75	36 - 108	2	40
Di-n-butyl phthalate	20.0	13.8		ug/L		69	37 - 111	0	38
Diethyl phthalate	20.0	13.0		ug/L		65	36 - 109	3	39
Dimethyl phthalate	20.0	13.6		ug/L		68	37 - 106	4	42
Di-n-octyl phthalate	20.0	14.3		ug/L		72	11 - 127	2	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-129469/3-A
Matrix: Water
Analysis Batch: 129601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 129469

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*
2-Fluorobiphenyl	*65*		*19 - 107*
2-Fluorophenol (Surr)	*74*		*10 - 111*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*
Phenol-d5 (Surr)	*74*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-129333/6
Matrix: Water
Analysis Batch: 129333

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			12/24/14 12:23	1

Lab Sample ID: LCS 180-129333/5
Matrix: Water
Analysis Batch: 129333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.4		mg/L		103	90 - 110

Lab Sample ID: 180-40119-1 MS
Matrix: Water
Analysis Batch: 129333

Client Sample ID: OC-FRAC 1-122314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	180		125	304		mg/L		100	80 - 120

Lab Sample ID: 180-40119-1 MSD
Matrix: Water
Analysis Batch: 129333

Client Sample ID: OC-FRAC 1-122314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	180		125	303		mg/L		99	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-129403/1-A
Matrix: Water
Analysis Batch: 129746

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 129403

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	9.5	ug/L		12/29/14 06:56	12/31/14 09:03	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 180-129403/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129763 — **Prep Batch: 129403**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		12/29/14 06:56	12/31/14 12:23	1
Nickel	ND		10	0.51	ug/L		12/29/14 06:56	12/31/14 12:23	1
Zinc	2.62	J	10	1.0	ug/L		12/29/14 06:56	12/31/14 12:23	1

Lab Sample ID: LCS 180-129403/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129746 — **Prep Batch: 129403**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	1000	1050		ug/L		105	85 - 115

Lab Sample ID: LCS 180-129403/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129763 — **Prep Batch: 129403**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	529		ug/L		106	85 - 115
Nickel	500	512		ug/L		102	85 - 115
Zinc	500	514		ug/L		103	85 - 115

Lab Sample ID: 180-40119-1 MS — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129746 — **Prep Batch: 129403**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	ND		1000	1100		ug/L		110	70 - 130

Lab Sample ID: 180-40119-1 MS — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129763 — **Prep Batch: 129403**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	561		ug/L		112	70 - 130
Nickel	1.2	J	500	538		ug/L		107	70 - 130
Zinc	21	B	500	546		ug/L		105	70 - 130

Lab Sample ID: 180-40119-1 MSD — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129746 — **Prep Batch: 129403**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	ND		1000	1090		ug/L		109	70 - 130	1	20

Lab Sample ID: 180-40119-1 MSD — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129763 — **Prep Batch: 129403**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	552		ug/L		110	70 - 130	2	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-40119-1 MSD — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 129763 — **Prep Batch: 129403**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nickel	1.2	J	500	529		ug/L		106	70 - 130	2	20
Zinc	21	B	500	540		ug/L		104	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-270315/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270369 — **Prep Batch: 270315**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		12/29/14 11:09	12/29/14 14:01	1

Lab Sample ID: LCS 500-270315/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270369 — **Prep Batch: 270315**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0986		mg/L		99	90 - 110

Lab Sample ID: 180-40119-1 MS — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270369 — **Prep Batch: 270315**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.0055		0.100	0.111		mg/L		105	75 - 125

Lab Sample ID: 180-40119-1 MSD — **Client Sample ID: OC-FRAC 1-122314**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270369 — **Prep Batch: 270315**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.0055		0.100	0.101		mg/L		95	75 - 125	10	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-270105/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270105

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			12/26/14 13:05	1

Lab Sample ID: LCS 500-270105/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 270105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	189		mg/L		95	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-270067/1
Matrix: Water
Analysis Batch: 270067

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			12/24/14 15:25	1

Lab Sample ID: 180-40119-1 DU
Matrix: Water
Analysis Batch: 270067

Client Sample ID: OC-FRAC 1-122314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 129469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	3520C	
LCS 180-129469/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-129469/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-129469/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 129601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	8270C LL	129469
LCS 180-129469/2-A	Lab Control Sample	Total/NA	Water	8270C LL	129469
LCSD 180-129469/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	129469
MB 180-129469/1-A	Method Blank	Total/NA	Water	8270C LL	129469

HPLC/IC

Analysis Batch: 129333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	300.0	
180-40119-1 MS	OC-FRAC 1-122314	Total/NA	Water	300.0	
180-40119-1 MSD	OC-FRAC 1-122314	Total/NA	Water	300.0	
LCS 180-129333/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-129333/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 129403

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total Recoverable	Water	200.7	
180-40119-1 MS	OC-FRAC 1-122314	Total Recoverable	Water	200.7	
180-40119-1 MSD	OC-FRAC 1-122314	Total Recoverable	Water	200.7	
LCS 180-129403/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-129403/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 129746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
180-40119-1 MS	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
180-40119-1 MSD	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
LCS 180-129403/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	129403
MB 180-129403/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	129403

Analysis Batch: 129763

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
180-40119-1 MS	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
180-40119-1 MSD	OC-FRAC 1-122314	Total Recoverable	Water	200.7 Rev 4.4	129403
LCS 180-129403/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	129403
MB 180-129403/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	129403

General Chemistry

Analysis Batch: 270067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	SM 4500 Cl F	
180-40119-1 DU	OC-FRAC 1-122314	Total/NA	Water	SM 4500 Cl F	
MB 500-270067/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 270105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	SM 2540D	
LCS 500-270105/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-270105/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 270315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	Distill/Phenol	
180-40119-1 MS	OC-FRAC 1-122314	Total/NA	Water	Distill/Phenol	
180-40119-1 MSD	OC-FRAC 1-122314	Total/NA	Water	Distill/Phenol	
LCS 500-270315/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-270315/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 270369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40119-1	OC-FRAC 1-122314	Total/NA	Water	420.4	270315
180-40119-1 MS	OC-FRAC 1-122314	Total/NA	Water	420.4	270315
180-40119-1 MSD	OC-FRAC 1-122314	Total/NA	Water	420.4	270315
LCS 500-270315/2-A	Lab Control Sample	Total/NA	Water	420.4	270315
MB 500-270315/1-A	Method Blank	Total/NA	Water	420.4	270315

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Client Sample ID: OC-FRAC 1-122314

Lab Sample ID: 180-40119-1

Date Collected: 12/23/14 11:00

Matrix: Water

Date Received: 12/24/14 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	129469	12/29/14 11:39	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	129601	12/30/14 19:46	VVP	TAL PIT
	Instrument ID: CH733									
Total/NA	Analysis	300.0		5	1 mL		129333	12/24/14 19:07	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	129403	12/29/14 06:56	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129763	12/31/14 12:38	RJR	TAL PIT
	Instrument ID: C									
Total Recoverable	Prep	200.7			50 mL	50 mL	129403	12/29/14 06:56	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	129746	12/31/14 09:19	RJR	TAL PIT
	Instrument ID: Q									
Total/NA	Prep	Distill/Phenol			100 mL	104 mL	270315	12/29/14 11:09	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	104 mL	270369	12/29/14 14:04	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	270105		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	12/26/14 13:41		
							(End)	12/26/14 13:43		
Total/NA	Analysis	SM 4500 Cl F		1			270067	12/24/14 15:26	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

SLB = Sandy Becker

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40119-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40119-1	OC-FRAC 1-122314	Water	12/23/14 11:00	12/24/14 10:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Cust

180-40119 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@tes...	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
Frac 1- 122314	12-23-14	1100	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: L Johnson	Date/Time: 12-23-14	Company	Received by:	Date/Time: 12-23-14 1130	Company		
Relinquished by:	Date/Time: 12-23-14 1630	Company TP	Received by: Mike Watson	Date/Time: 12-24-14	Company AP		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10:10	Company		
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:				

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40119-1

Login Number: 40119

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40119-1

Login Number: 40119

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40248-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/9/2015 11:30:58 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Job ID: 180-40248-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 1/6/2015 11:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.1º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 130072. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Client Sample ID: OC-FRAC 3- 010515

Lab Sample ID: 180-40248-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.34	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	170		10	2.0	mg/L	10		300.0	Total/NA
Iron	9.5	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.1	J B	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	16	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.010		0.0053	0.0023	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 3- 010515
Date Collected: 01/05/15 10:00
Date Received: 01/06/15 11:30

Lab Sample ID: 180-40248-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/06/15 12:45	01/07/15 16:31	1
Butyl benzyl phthalate	**0.34**	**J**	0.94	0.13	ug/L		01/06/15 12:45	01/07/15 16:31	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		01/06/15 12:45	01/07/15 16:31	1
Diethyl phthalate	ND		0.94	0.14	ug/L		01/06/15 12:45	01/07/15 16:31	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		01/06/15 12:45	01/07/15 16:31	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		01/06/15 12:45	01/07/15 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*56*		*16 - 122*	*01/06/15 12:45*	*01/07/15 16:31*	*1*
2-Fluorobiphenyl	*49*		*19 - 107*	*01/06/15 12:45*	*01/07/15 16:31*	*1*
2-Fluorophenol (Surr)	*43*		*10 - 111*	*01/06/15 12:45*	*01/07/15 16:31*	*1*
Nitrobenzene-d5 (Surr)	*47*		*23 - 112*	*01/06/15 12:45*	*01/07/15 16:31*	*1*
Phenol-d5 (Surr)	*47*		*15 - 112*	*01/06/15 12:45*	*01/07/15 16:31*	*1*
Terphenyl-d14	*76*		*10 - 132*	*01/06/15 12:45*	*01/07/15 16:31*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		10	2.0	mg/L			01/07/15 18:50	10

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/07/15 08:03	01/09/15 06:51	1
Iron	**9.5**	**J**	50	9.5	ug/L		01/07/15 08:03	01/08/15 16:57	1
Nickel	**1.1**	**J B**	10	0.51	ug/L		01/07/15 08:03	01/08/15 16:57	1
Zinc	**16**	**B**	10	1.0	ug/L		01/07/15 08:03	01/08/15 16:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.010**		0.0053	0.0023	mg/L		01/07/15 13:03	01/07/15 14:50	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/06/15 22:57	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/06/15 21:11	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40248-1	OC-FRAC 3- 010515	56	49	43	47	47	76		
LCS 180-130072/2-A	Lab Control Sample	68	62	56	60	58	72		
LCSD 180-130072/3-A	Lab Control Sample Dup	67	59	53	59	55	68		
MB 180-130072/1-A	Method Blank	58	66	72	69	71	73		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-130072/1-A
Matrix: Water
Analysis Batch: 130156

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 130072

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/06/15 12:45	01/07/15 14:15	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/06/15 12:45	01/07/15 14:15	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/06/15 12:45	01/07/15 14:15	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/06/15 12:45	01/07/15 14:15	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/06/15 12:45	01/07/15 14:15	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/06/15 12:45	01/07/15 14:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*58*		*16 - 122*	*01/06/15 12:45*	*01/07/15 14:15*	*1*
2-Fluorobiphenyl	*66*		*19 - 107*	*01/06/15 12:45*	*01/07/15 14:15*	*1*
2-Fluorophenol (Surr)	*72*		*10 - 111*	*01/06/15 12:45*	*01/07/15 14:15*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*	*01/06/15 12:45*	*01/07/15 14:15*	*1*
Phenol-d5 (Surr)	*71*		*15 - 112*	*01/06/15 12:45*	*01/07/15 14:15*	*1*
Terphenyl-d14	*73*		*10 - 132*	*01/06/15 12:45*	*01/07/15 14:15*	*1*

Lab Sample ID: LCS 180-130072/2-A
Matrix: Water
Analysis Batch: 130156

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 130072

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.7		ug/L		84	20 - 116
Butyl benzyl phthalate	20.0	17.6		ug/L		88	36 - 108
Di-n-butyl phthalate	20.0	16.9		ug/L		85	37 - 111
Diethyl phthalate	20.0	14.4		ug/L		72	36 - 109
Dimethyl phthalate	20.0	13.9		ug/L		69	37 - 106
Di-n-octyl phthalate	20.0	17.7		ug/L		88	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*62*		*19 - 107*
2-Fluorophenol (Surr)	*56*		*10 - 111*
Nitrobenzene-d5 (Surr)	*60*		*23 - 112*
Phenol-d5 (Surr)	*58*		*15 - 112*
Terphenyl-d14	*72*		*10 - 132*

Lab Sample ID: LCSD 180-130072/3-A
Matrix: Water
Analysis Batch: 130156

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130072

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		77	20 - 116	8	40
Butyl benzyl phthalate	20.0	16.6		ug/L		83	36 - 108	6	40
Di-n-butyl phthalate	20.0	16.3		ug/L		82	37 - 111	3	38
Diethyl phthalate	20.0	13.5		ug/L		68	36 - 109	6	39
Dimethyl phthalate	20.0	13.2		ug/L		66	37 - 106	5	42
Di-n-octyl phthalate	20.0	17.6		ug/L		88	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-130072/3-A
Matrix: Water
Analysis Batch: 130156

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130072

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*59*		*19 - 107*
2-Fluorophenol (Surr)	*53*		*10 - 111*
Nitrobenzene-d5 (Surr)	*59*		*23 - 112*
Phenol-d5 (Surr)	*55*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-130228/6
Matrix: Water
Analysis Batch: 130228

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			01/07/15 18:16	1

Lab Sample ID: LCS 180-130228/5
Matrix: Water
Analysis Batch: 130228

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.2		mg/L		102	90 - 110

Lab Sample ID: 180-40248-1 MS
Matrix: Water
Analysis Batch: 130228

Client Sample ID: OC-FRAC 3- 010515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	170		250	432		mg/L		104	80 - 120

Lab Sample ID: 180-40248-1 MSD
Matrix: Water
Analysis Batch: 130228

Client Sample ID: OC-FRAC 3- 010515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	170		250	432		mg/L		104	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-130151/1-A
Matrix: Water
Analysis Batch: 130369

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 130151

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		50	9.5	ug/L		01/07/15 08:03	01/08/15 16:13	1
Nickel	0.510	J	10	0.51	ug/L		01/07/15 08:03	01/08/15 16:13	1
Zinc	3.09	J	10	1.0	ug/L		01/07/15 08:03	01/08/15 16:13	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 180-130151/1-A
Matrix: Water
Analysis Batch: 130400

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 130151

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/07/15 08:03	01/09/15 06:18	1

Lab Sample ID: LCS 180-130151/2-A
Matrix: Water
Analysis Batch: 130369

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 130151

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	1000	1060		ug/L		106	85 - 115
Nickel	500	526		ug/L		105	85 - 115
Zinc	500	514		ug/L		103	85 - 115

Lab Sample ID: LCS 180-130151/2-A
Matrix: Water
Analysis Batch: 130400

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 130151

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	538		ug/L		108	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-271387/1-A
Matrix: Water
Analysis Batch: 271407

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 271387

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		01/07/15 13:03	01/07/15 14:40	1

Lab Sample ID: LCS 500-271387/2-A
Matrix: Water
Analysis Batch: 271407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 271387

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0975		mg/L		98	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-271287/1
Matrix: Water
Analysis Batch: 271287

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/06/15 22:34	1

Lab Sample ID: LCS 500-271287/2
Matrix: Water
Analysis Batch: 271287

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	212		mg/L		106	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-271282/1
Matrix: Water
Analysis Batch: 271282

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/06/15 21:10	1

Lab Sample ID: 180-40248-1 DU
Matrix: Water
Analysis Batch: 271282

Client Sample ID: OC-FRAC 3- 010515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

GC/MS Semi VOA

Prep Batch: 130072

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	3520C	
LCS 180-130072/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-130072/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-130072/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 130156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	8270C LL	130072
LCS 180-130072/2-A	Lab Control Sample	Total/NA	Water	8270C LL	130072
LCSD 180-130072/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	130072
MB 180-130072/1-A	Method Blank	Total/NA	Water	8270C LL	130072

HPLC/IC

Analysis Batch: 130228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	300.0	
180-40248-1 MS	OC-FRAC 3- 010515	Total/NA	Water	300.0	
180-40248-1 MSD	OC-FRAC 3- 010515	Total/NA	Water	300.0	
LCS 180-130228/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-130228/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 130151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total Recoverable	Water	200.7	
LCS 180-130151/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-130151/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 130369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total Recoverable	Water	200.7 Rev 4.4	130151
LCS 180-130151/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	130151
MB 180-130151/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	130151

Analysis Batch: 130400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total Recoverable	Water	200.7 Rev 4.4	130151
LCS 180-130151/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	130151
MB 180-130151/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	130151

General Chemistry

Analysis Batch: 271282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	SM 4500 Cl F	
180-40248-1 DU	OC-FRAC 3- 010515	Total/NA	Water	SM 4500 Cl F	
MB 500-271282/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 271287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	SM 2540D	
LCS 500-271287/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-271287/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 271387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	Distill/Phenol	
LCS 500-271387/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-271387/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 271407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40248-1	OC-FRAC 3- 010515	Total/NA	Water	420.4	271387
LCS 500-271387/2-A	Lab Control Sample	Total/NA	Water	420.4	271387
MB 500-271387/1-A	Method Blank	Total/NA	Water	420.4	271387

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Client Sample ID: OC-FRAC 3- 010515
Date Collected: 01/05/15 10:00
Date Received: 01/06/15 11:30

Lab Sample ID: 180-40248-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	130072	01/06/15 12:45	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	130156	01/07/15 16:31	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		10	1 mL		130228	01/07/15 18:50	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	130151	01/07/15 08:03	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	130369	01/08/15 16:57	RJG	TAL PIT
	Instrument ID: Q									
Total Recoverable	Prep	200.7			50 mL	50 mL	130151	01/07/15 08:03	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	130400	01/09/15 06:51	RJG	TAL PIT
	Instrument ID: Q									
Total/NA	Prep	Distill/Phenol			100 mL	105 mL	271387	01/07/15 13:03	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	105 mL	271407	01/07/15 14:50	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	271287		CLB	TAL CHI
	Instrument ID: NOEQUIP							(Start) 01/06/15 22:57		
								(End) 01/06/15 23:00		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	271282	01/06/15 21:11	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

CLB = Cheryl Boyd

HMW = Heather Wontor

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40248-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40248-1	OC-FRAC 3- 010515	Water	01/05/15 10:00	01/06/15 11:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody R

180-40248 Chain of Custody

TestAmerica

BNAs 3 yr ext 2BB 40 AA

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC3-010515	1-5-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	1-5-15 1100			1-5-15 1100	FD
2		1-5-15 1630	TAP		1-6-15 11:30	TAP
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

1/9/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40248-1

Login Number: 40248

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40248-1

Login Number: 40248

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40279-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/9/2015 4:52:55 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Job ID: 180-40279-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 1/7/2015 10:20 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.4º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 130161. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Client Sample ID: OC-FRAC 4-010615

Lab Sample ID: 180-40279-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.46	J	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	170		5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	0.96	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	19	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 4-010615
Date Collected: 01/06/15 10:00
Date Received: 01/07/15 10:20

Lab Sample ID: 180-40279-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/07/15 12:02	01/08/15 12:42	1
Butyl benzyl phthalate	**0.46**	**J**	0.95	0.14	ug/L		01/07/15 12:02	01/08/15 12:42	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		01/07/15 12:02	01/08/15 12:42	1
Diethyl phthalate	ND		0.95	0.14	ug/L		01/07/15 12:02	01/08/15 12:42	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		01/07/15 12:02	01/08/15 12:42	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		01/07/15 12:02	01/08/15 12:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*77*		*16 - 122*	*01/07/15 12:02*	*01/08/15 12:42*	*1*
2-Fluorobiphenyl	*76*		*19 - 107*	*01/07/15 12:02*	*01/08/15 12:42*	*1*
2-Fluorophenol (Surr)	*73*		*10 - 111*	*01/07/15 12:02*	*01/08/15 12:42*	*1*
Nitrobenzene-d5 (Surr)	*81*		*23 - 112*	*01/07/15 12:02*	*01/08/15 12:42*	*1*
Phenol-d5 (Surr)	*78*		*15 - 112*	*01/07/15 12:02*	*01/08/15 12:42*	*1*
Terphenyl-d14	*79*		*10 - 132*	*01/07/15 12:02*	*01/08/15 12:42*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		5.0	0.98	mg/L			01/08/15 13:42	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/08/15 08:52	01/09/15 10:48	1
Iron	ND		50	9.5	ug/L		01/08/15 08:52	01/09/15 10:48	1
Nickel	**0.96**	**J**	10	0.51	ug/L		01/08/15 08:52	01/09/15 10:48	1
Zinc	**19**	**B**	10	1.0	ug/L		01/08/15 08:52	01/09/15 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		01/09/15 10:32	01/09/15 14:08	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/08/15 12:14	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/07/15 16:01	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40279-1	OC-FRAC 4-010615	77	76	73	81	78	79		
LCS 180-130161/2-A	Lab Control Sample	68	64	62	72	69	71		
LCSD 180-130161/3-A	Lab Control Sample Dup	66	61	60	65	68	64		
MB 180-130161/1-A	Method Blank	59	63	65	65	64	67		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-130161/1-A
Matrix: Water
Analysis Batch: 130261

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 130161

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/07/15 08:50	01/08/15 09:33	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/07/15 08:50	01/08/15 09:33	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/07/15 08:50	01/08/15 09:33	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/07/15 08:50	01/08/15 09:33	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/07/15 08:50	01/08/15 09:33	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/07/15 08:50	01/08/15 09:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*16 - 122*	*01/07/15 08:50*	*01/08/15 09:33*	*1*
2-Fluorobiphenyl	*63*		*19 - 107*	*01/07/15 08:50*	*01/08/15 09:33*	*1*
2-Fluorophenol (Surr)	*65*		*10 - 111*	*01/07/15 08:50*	*01/08/15 09:33*	*1*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*	*01/07/15 08:50*	*01/08/15 09:33*	*1*
Phenol-d5 (Surr)	*64*		*15 - 112*	*01/07/15 08:50*	*01/08/15 09:33*	*1*
Terphenyl-d14	*67*		*10 - 132*	*01/07/15 08:50*	*01/08/15 09:33*	*1*

Lab Sample ID: LCS 180-130161/2-A
Matrix: Water
Analysis Batch: 130261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 130161

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			20.0	16.3		ug/L		82	20 - 116		
Butyl benzyl phthalate			20.0	17.0		ug/L		85	36 - 108		
Di-n-butyl phthalate			20.0	16.5		ug/L		83	37 - 111		
Diethyl phthalate			20.0	14.9		ug/L		74	36 - 109		
Dimethyl phthalate			20.0	14.8		ug/L		74	37 - 106		
Di-n-octyl phthalate			20.0	16.5		ug/L		82	11 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*62*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*71*		*10 - 132*

Lab Sample ID: LCSD 180-130161/3-A
Matrix: Water
Analysis Batch: 130261

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130161

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	15.0		ug/L		75	20 - 116	8	40
Butyl benzyl phthalate			20.0	15.9		ug/L		79	36 - 108	7	40
Di-n-butyl phthalate			20.0	16.1		ug/L		81	37 - 111	3	38
Diethyl phthalate			20.0	14.0		ug/L		70	36 - 109	6	39
Dimethyl phthalate			20.0	13.8		ug/L		69	37 - 106	7	42
Di-n-octyl phthalate			20.0	16.5		ug/L		82	11 - 127	0	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-130161/3-A
Matrix: Water
Analysis Batch: 130261

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130161

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*66*		*16 - 122*
2-Fluorobiphenyl	*61*		*19 - 107*
2-Fluorophenol (Surr)	*60*		*10 - 111*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*
Phenol-d5 (Surr)	*68*		*15 - 112*
Terphenyl-d14	*64*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-130337/6
Matrix: Water
Analysis Batch: 130337

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			01/08/15 12:37	1

Lab Sample ID: LCS 180-130337/5
Matrix: Water
Analysis Batch: 130337

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.4		mg/L		103	90 - 110

Lab Sample ID: 180-40279-1 MS
Matrix: Water
Analysis Batch: 130337

Client Sample ID: OC-FRAC 4-010615
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	170		125	297		mg/L		102	80 - 120

Lab Sample ID: 180-40279-1 MSD
Matrix: Water
Analysis Batch: 130337

Client Sample ID: OC-FRAC 4-010615
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	170		125	297		mg/L		102	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-130280/1-A
Matrix: Water
Analysis Batch: 130427

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 130280

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/08/15 08:52	01/09/15 10:38	1
Iron	ND		50	9.5	ug/L		01/08/15 08:52	01/09/15 10:38	1
Nickel	ND		10	0.51	ug/L		01/08/15 08:52	01/09/15 10:38	1
Zinc	2.61	J	10	1.0	ug/L		01/08/15 08:52	01/09/15 10:38	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-130280/2-A
Matrix: Water
Analysis Batch: 130427

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 130280

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			500	527		ug/L		105	85 - 115		
Iron			1000	1010		ug/L		101	85 - 115		
Nickel			500	515		ug/L		103	85 - 115		
Zinc			500	505		ug/L		101	85 - 115		

Lab Sample ID: 180-40279-1 MS
Matrix: Water
Analysis Batch: 130427

Client Sample ID: OC-FRAC 4-010615
Prep Type: Total Recoverable
Prep Batch: 130280

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		500	535		ug/L		107	70 - 130		
Iron	ND		1000	1010		ug/L		101	70 - 130		
Nickel	0.96	J	500	520		ug/L		104	70 - 130		
Zinc	19	B	500	518		ug/L		100	70 - 130		

Lab Sample ID: 180-40279-1 MSD
Matrix: Water
Analysis Batch: 130427

Client Sample ID: OC-FRAC 4-010615
Prep Type: Total Recoverable
Prep Batch: 130280

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	530		ug/L		106	70 - 130	1	20
Iron	ND		1000	992		ug/L		99	70 - 130	2	20
Nickel	0.96	J	500	512		ug/L		102	70 - 130	2	20
Zinc	19	B	500	511		ug/L		98	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-271621/1-A
Matrix: Water
Analysis Batch: 271668

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 271621

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/09/15 10:32	01/09/15 14:02	1

Lab Sample ID: LCS 500-271621/2-A
Matrix: Water
Analysis Batch: 271668

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 271621

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Phenolics, Total Recoverable			0.100	0.0977		mg/L		98	90 - 110		

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-271515/1
Matrix: Water
Analysis Batch: 271515

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/08/15 11:15	1

Lab Sample ID: LCS 500-271515/2
Matrix: Water
Analysis Batch: 271515

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			200	176		mg/L		88	80 - 120		

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-271671/1
Matrix: Water
Analysis Batch: 271671

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/07/15 16:00	1

Lab Sample ID: 180-40279-1 DU
Matrix: Water
Analysis Batch: 271671

Client Sample ID: OC-FRAC 4-010615
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

GC/MS Semi VOA

Prep Batch: 130161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	3520C	
LCS 180-130161/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-130161/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-130161/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 130261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	8270C LL	130161
LCS 180-130161/2-A	Lab Control Sample	Total/NA	Water	8270C LL	130161
LCSD 180-130161/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	130161
MB 180-130161/1-A	Method Blank	Total/NA	Water	8270C LL	130161

HPLC/IC

Analysis Batch: 130337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	300.0	
180-40279-1 MS	OC-FRAC 4-010615	Total/NA	Water	300.0	
180-40279-1 MSD	OC-FRAC 4-010615	Total/NA	Water	300.0	
LCS 180-130337/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-130337/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 130280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total Recoverable	Water	200.7	
180-40279-1 MS	OC-FRAC 4-010615	Total Recoverable	Water	200.7	
180-40279-1 MSD	OC-FRAC 4-010615	Total Recoverable	Water	200.7	
LCS 180-130280/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-130280/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 130427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total Recoverable	Water	200.7 Rev 4.4	130280
180-40279-1 MS	OC-FRAC 4-010615	Total Recoverable	Water	200.7 Rev 4.4	130280
180-40279-1 MSD	OC-FRAC 4-010615	Total Recoverable	Water	200.7 Rev 4.4	130280
LCS 180-130280/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	130280
MB 180-130280/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	130280

General Chemistry

Analysis Batch: 271515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	SM 2540D	
LCS 500-271515/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-271515/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 271621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	Distill/Phenol	
LCS 500-271621/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-271621/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 271668

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	420.4	271621
LCS 500-271621/2-A	Lab Control Sample	Total/NA	Water	420.4	271621
MB 500-271621/1-A	Method Blank	Total/NA	Water	420.4	271621

Analysis Batch: 271671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40279-1	OC-FRAC 4-010615	Total/NA	Water	SM 4500 Cl F	
180-40279-1 DU	OC-FRAC 4-010615	Total/NA	Water	SM 4500 Cl F	
MB 500-271671/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Client Sample ID: OC-FRAC 4-010615
Date Collected: 01/06/15 10:00
Date Received: 01/07/15 10:20

Lab Sample ID: 180-40279-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1050 mL	1.0 mL	130161	01/07/15 12:02	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1050 mL	1.0 mL	130261	01/08/15 12:42	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL	1.0 mL	130337	01/08/15 13:42	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	130280	01/08/15 08:52	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	130427	01/09/15 10:48	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	271621	01/09/15 10:32	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	271668	01/09/15 14:08	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	271515		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	01/08/15 12:14		
							(End)	01/08/15 12:17		
Total/NA	Analysis	SM 4500 Cl F		1			271671	01/07/15 16:01	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15 *
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40279-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40279-1	OC-FRAC 4-010615	Water	01/06/15 10:00	01/07/15 10:20

BNA
1
met
2BB
40BI
39EE

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNa02, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
				Preservation Code:	X	X	N	N	N	D	S	N	N	X	
FRAC4 · 010615	1-6-15	1000	G	Water			X		X	X	X	X	X		
				Water											

180-40279 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	1-6-15		[signature]	1-6-15 1125	TA
[signature]	1-6-15 1630	TA	[signature]	1-7-15 10:20	TAP

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40279-1

Login Number: 40279

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40279-1

Login Number: 40279

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40438-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/19/2015 10:17:16 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Job ID: 180-40438-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 1/14/2015 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.9º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 130729. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Client Sample ID: OC-FRAC 5-011315

Lab Sample ID: 180-40438-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.30	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	160		5.0	0.98	mg/L	5		300.0	Total/NA
Iron	31	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.84	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	27	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 5-011315
Date Collected: 01/13/15 10:00
Date Received: 01/14/15 09:15

Lab Sample ID: 180-40438-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/14/15 11:39	01/15/15 17:05	1
Butyl benzyl phthalate	**0.30**	**J**	0.94	0.13	ug/L		01/14/15 11:39	01/15/15 17:05	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		01/14/15 11:39	01/15/15 17:05	1
Diethyl phthalate	ND		0.94	0.14	ug/L		01/14/15 11:39	01/15/15 17:05	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		01/14/15 11:39	01/15/15 17:05	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		01/14/15 11:39	01/15/15 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*66*		*16 - 122*	*01/14/15 11:39*	*01/15/15 17:05*	*1*
2-Fluorobiphenyl	*62*		*19 - 107*	*01/14/15 11:39*	*01/15/15 17:05*	*1*
2-Fluorophenol (Surr)	*59*		*10 - 111*	*01/14/15 11:39*	*01/15/15 17:05*	*1*
Nitrobenzene-d5 (Surr)	*65*		*23 - 112*	*01/14/15 11:39*	*01/15/15 17:05*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*01/14/15 11:39*	*01/15/15 17:05*	*1*
Terphenyl-d14	*85*		*10 - 132*	*01/14/15 11:39*	*01/15/15 17:05*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		5.0	0.98	mg/L			01/14/15 12:13	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/15/15 08:23	01/16/15 10:24	1
Iron	**31**	**J**	50	9.5	ug/L		01/15/15 08:23	01/16/15 10:24	1
Nickel	**0.84**	**J**	10	0.51	ug/L		01/15/15 08:23	01/16/15 10:24	1
Zinc	**27**	**B**	10	1.0	ug/L		01/15/15 08:23	01/16/15 10:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		01/16/15 09:33	01/16/15 13:47	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/15/15 14:13	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/14/15 16:01	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40438-1	OC-FRAC 5-011315	66	62	59	65	63	85		
LCS 180-130729/2-A	Lab Control Sample	66	64	67	71	67	63		
LCSD 180-130729/3-A	Lab Control Sample Dup	70	68	61	68	68	65		
MB 180-130729/1-A	Method Blank	65	74	70	70	72	72		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-130729/1-A
Matrix: Water
Analysis Batch: 130780

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 130729

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/14/15 11:39	01/15/15 10:36	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/14/15 11:39	01/15/15 10:36	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/14/15 11:39	01/15/15 10:36	1
Diethyl phthalate	0.178	J	1.0	0.15	ug/L		01/14/15 11:39	01/15/15 10:36	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/14/15 11:39	01/15/15 10:36	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/14/15 11:39	01/15/15 10:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*01/14/15 11:39*	*01/15/15 10:36*	*1*
2-Fluorobiphenyl	*74*		*19 - 107*	*01/14/15 11:39*	*01/15/15 10:36*	*1*
2-Fluorophenol (Surr)	*70*		*10 - 111*	*01/14/15 11:39*	*01/15/15 10:36*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*01/14/15 11:39*	*01/15/15 10:36*	*1*
Phenol-d5 (Surr)	*72*		*15 - 112*	*01/14/15 11:39*	*01/15/15 10:36*	*1*
Terphenyl-d14	*72*		*10 - 132*	*01/14/15 11:39*	*01/15/15 10:36*	*1*

Lab Sample ID: LCS 180-130729/2-A
Matrix: Water
Analysis Batch: 130780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 130729

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.9		ug/L		74	20 - 116
Butyl benzyl phthalate	20.0	15.8		ug/L		79	36 - 108
Di-n-butyl phthalate	20.0	16.0		ug/L		80	37 - 111
Diethyl phthalate	20.0	14.1		ug/L		71	36 - 109
Dimethyl phthalate	20.0	14.0		ug/L		70	37 - 106
Di-n-octyl phthalate	20.0	15.4		ug/L		77	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*66*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*
Phenol-d5 (Surr)	*67*		*15 - 112*
Terphenyl-d14	*63*		*10 - 132*

Lab Sample ID: LCSD 180-130729/3-A
Matrix: Water
Analysis Batch: 130780

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130729

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.4		ug/L		77	20 - 116	3	40
Butyl benzyl phthalate	20.0	16.7		ug/L		83	36 - 108	5	40
Di-n-butyl phthalate	20.0	15.7		ug/L		79	37 - 111	2	38
Diethyl phthalate	20.0	15.4		ug/L		77	36 - 109	9	39
Dimethyl phthalate	20.0	15.0		ug/L		75	37 - 106	7	42
Di-n-octyl phthalate	20.0	16.5		ug/L		82	11 - 127	7	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-130729/3-A
Matrix: Water
Analysis Batch: 130780

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 130729

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*61*		*10 - 111*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*
Phenol-d5 (Surr)	*68*		*15 - 112*
Terphenyl-d14	*65*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-130742/6
Matrix: Water
Analysis Batch: 130742

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			01/14/15 11:40	1

Lab Sample ID: LCS 180-130742/5
Matrix: Water
Analysis Batch: 130742

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.9		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-130795/1-A
Matrix: Water
Analysis Batch: 131009

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 130795

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/15/15 08:23	01/16/15 09:47	1
Iron	ND		50	9.5	ug/L		01/15/15 08:23	01/16/15 09:47	1
Nickel	ND		10	0.51	ug/L		01/15/15 08:23	01/16/15 09:47	1
Zinc	4.18	J	10	1.0	ug/L		01/15/15 08:23	01/16/15 09:47	1

Lab Sample ID: LCS 180-130795/2-A
Matrix: Water
Analysis Batch: 131009

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 130795

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	526		ug/L		105	85 - 115
Iron	1000	1060		ug/L		106	85 - 115
Nickel	500	508		ug/L		102	85 - 115
Zinc	500	510		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-272466/1-A
Matrix: Water
Analysis Batch: 272530

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 272466

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/16/15 09:33	01/16/15 13:41	1

Lab Sample ID: LCS 500-272466/2-A
Matrix: Water
Analysis Batch: 272530

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 272466

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.103		mg/L		103	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-272359/1
Matrix: Water
Analysis Batch: 272359

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/15/15 14:10	1

Lab Sample ID: LCS 500-272359/2
Matrix: Water
Analysis Batch: 272359

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	193		mg/L		96	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-272238/1
Matrix: Water
Analysis Batch: 272238

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/14/15 16:00	1

Lab Sample ID: 180-40438-1 DU
Matrix: Water
Analysis Batch: 272238

Client Sample ID: OC-FRAC 5-011315
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 130729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	3520C	
LCS 180-130729/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-130729/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-130729/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 130780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	8270C LL	130729
LCS 180-130729/2-A	Lab Control Sample	Total/NA	Water	8270C LL	130729
LCSD 180-130729/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	130729
MB 180-130729/1-A	Method Blank	Total/NA	Water	8270C LL	130729

HPLC/IC

Analysis Batch: 130742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	300.0	
LCS 180-130742/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-130742/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 130795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total Recoverable	Water	200.7	
LCS 180-130795/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-130795/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131009

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total Recoverable	Water	200.7 Rev 4.4	130795
LCS 180-130795/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	130795
MB 180-130795/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	130795

General Chemistry

Analysis Batch: 272238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	SM 4500 Cl F	
180-40438-1 DU	OC-FRAC 5-011315	Total/NA	Water	SM 4500 Cl F	
MB 500-272238/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 272359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	SM 2540D	
LCS 500-272359/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-272359/1	Method Blank	Total/NA	Water	SM 2540D	

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

General Chemistry (Continued)

Prep Batch: 272466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	Distill/Phenol	
LCS 500-272466/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-272466/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 272530

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40438-1	OC-FRAC 5-011315	Total/NA	Water	420.4	272466
LCS 500-272466/2-A	Lab Control Sample	Total/NA	Water	420.4	272466
MB 500-272466/1-A	Method Blank	Total/NA	Water	420.4	272466

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Client Sample ID: OC-FRAC 5-011315
Date Collected: 01/13/15 10:00
Date Received: 01/14/15 09:15

Lab Sample ID: 180-40438-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	130729	01/14/15 11:39	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	130780	01/15/15 17:05	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		130742	01/14/15 12:13	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	130795	01/15/15 08:23	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131009	01/16/15 10:24	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	101 mL	272466	01/16/15 09:33	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	101 mL	272530	01/16/15 13:47	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	272359		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 01/15/15 14:13		
								(End) 01/15/15 14:15		
Total/NA	Analysis	SM 4500 Cl F		1			272238	01/14/15 16:01	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	01-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40438-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40438-1	OC-FRAC 5-011315	Water	01/13/15 10:00	01/14/15 09:15

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custoc

180-40438 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 180-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testa	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 5 - 011315	1-13-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 1-13-15	Company	Received by:	Date/Time: 1-13-15 1115	Company TB.
Relinquished by:	Date/Time: 1-13-15 1200	Company	Received by: Dell Treadwell	Date/Time: 1-14-15 9:15	Company TA
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40438-1

Login Number: 40438

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40438-1

Login Number: 40438

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40438-1

Login Number: 40438
List Number: 3
Creator: Lunt, Jeff T

List Source: TestAmerica Chicago
List Creation: 01/14/15 01:49 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 1/29/15

TestAmerica Job ID: 180-40539-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
1/23/2015 11:58:26 AM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-40539-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-40539-1

Receipt
The sample was received on 1/17/2015 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

Except:

The unpreserved container for this sample FRAC-1 has a collection date of 1-16-15 and a collection time of 10:00 on the label; however the id reads FRAC 2-011515. It was determined to be FRAC-1 by the date and collection time. The second OLIN sample received today which is in a separate login has the correct id, collection date and collection time.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 131085 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Client Sample ID: OC-FRAC 1- 011615

Lab Sample ID: 180-40539-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.35	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	150		5.0	0.98	mg/L	5		300.0	Total/NA
Iron	18	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	2.1	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	12	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 1- 011615
Date Collected: 01/16/15 10:00
Date Received: 01/17/15 09:30

Lab Sample ID: 180-40539-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/19/15 09:49	01/20/15 15:13	1
Butyl benzyl phthalate	**0.35**	**J**	0.94	0.13	ug/L		01/19/15 09:49	01/20/15 15:13	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		01/19/15 09:49	01/20/15 15:13	1
Diethyl phthalate	ND		0.94	0.14	ug/L		01/19/15 09:49	01/20/15 15:13	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		01/19/15 09:49	01/20/15 15:13	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		01/19/15 09:49	01/20/15 15:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*16 - 122*	*01/19/15 09:49*	*01/20/15 15:13*	*1*
2-Fluorobiphenyl	*59*		*19 - 107*	*01/19/15 09:49*	*01/20/15 15:13*	*1*
2-Fluorophenol (Surr)	*55*		*10 - 111*	*01/19/15 09:49*	*01/20/15 15:13*	*1*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*	*01/19/15 09:49*	*01/20/15 15:13*	*1*
Phenol-d5 (Surr)	*57*		*15 - 112*	*01/19/15 09:49*	*01/20/15 15:13*	*1*
Terphenyl-d14	*78*		*10 - 132*	*01/19/15 09:49*	*01/20/15 15:13*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		5.0	0.98	mg/L			01/17/15 18:23	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/21/15 09:42	01/22/15 08:01	1
Iron	**18**	**J**	50	9.5	ug/L		01/21/15 09:42	01/22/15 08:01	1
Nickel	**2.1**	**J**	10	0.51	ug/L		01/21/15 09:42	01/22/15 08:01	1
Zinc	**12**	**B**	10	1.0	ug/L		01/21/15 09:42	01/22/15 08:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/19/15 12:24	01/19/15 14:39	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/19/15 09:10	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/18/15 22:25	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40539-1	OC-FRAC 1- 011615	59	59	55	64	57	78		
LCS 180-131085/2-A	Lab Control Sample	67	66	72	75	72	66		
LCSD 180-131085/3-A	Lab Control Sample Dup	73	69	69	71	71	68		
MB 180-131085/1-A	Method Blank	65	68	73	74	74	74		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131085/1-A
Matrix: Water
Analysis Batch: 131157

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 131085

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/19/15 09:49	01/20/15 11:00	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/19/15 09:49	01/20/15 11:00	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/19/15 09:49	01/20/15 11:00	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/19/15 09:49	01/20/15 11:00	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/19/15 09:49	01/20/15 11:00	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/19/15 09:49	01/20/15 11:00	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
2-Fluorobiphenyl	*68*		*19 - 107*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
2-Fluorophenol (Surr)	*73*		*10 - 111*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Phenol-d5 (Surr)	*74*		*15 - 112*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Terphenyl-d14	*74*		*10 - 132*	*01/19/15 09:49*	*01/20/15 11:00*	*1*

Lab Sample ID: LCS 180-131085/2-A
Matrix: Water
Analysis Batch: 131157

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 131085

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			20.0	14.5		ug/L		72	20 - 116		
Butyl benzyl phthalate			20.0	15.2		ug/L		76	36 - 108		
Di-n-butyl phthalate			20.0	15.1		ug/L		76	37 - 111		
Diethyl phthalate			20.0	13.8		ug/L		69	36 - 109		
Dimethyl phthalate			20.0	13.7		ug/L		68	37 - 106		
Di-n-octyl phthalate			20.0	15.6		ug/L		78	11 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*66*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*75*		*23 - 112*
Phenol-d5 (Surr)	*72*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Lab Sample ID: LCSD 180-131085/3-A
Matrix: Water
Analysis Batch: 131157

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131085

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	14.3		ug/L		72	20 - 116	1	40
Butyl benzyl phthalate			20.0	15.7		ug/L		79	36 - 108	4	40
Di-n-butyl phthalate			20.0	15.5		ug/L		77	37 - 111	2	38
Diethyl phthalate			20.0	14.2		ug/L		71	36 - 109	3	39
Dimethyl phthalate			20.0	14.1		ug/L		70	37 - 106	3	42
Di-n-octyl phthalate			20.0	15.7		ug/L		78	11 - 127	0	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-131085/3-A
Matrix: Water
Analysis Batch: 131157

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131085

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*
2-Fluorobiphenyl	*69*		*19 - 107*
2-Fluorophenol (Surr)	*69*		*10 - 111*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*
Phenol-d5 (Surr)	*71*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131000/6
Matrix: Water
Analysis Batch: 131000

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			01/17/15 10:53	1

Lab Sample ID: LCS 180-131000/5
Matrix: Water
Analysis Batch: 131000

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	52.3		mg/L		105	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131309/1-A
Matrix: Water
Analysis Batch: 131475

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/21/15 09:42	01/22/15 07:41	1
Iron	ND		50	9.5	ug/L		01/21/15 09:42	01/22/15 07:41	1
Nickel	ND		10	0.51	ug/L		01/21/15 09:42	01/22/15 07:41	1
Zinc	1.61	J	10	1.0	ug/L		01/21/15 09:42	01/22/15 07:41	1

Lab Sample ID: LCS 180-131309/2-A
Matrix: Water
Analysis Batch: 131475

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	503		ug/L		101	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	488		ug/L		98	85 - 115
Zinc	500	486		ug/L		97	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-131309/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 131475 — **Prep Batch: 131309**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	513		ug/L		103	85 - 115	2	20
Iron	1000	1050		ug/L		105	85 - 115	2	20
Nickel	500	500		ug/L		100	85 - 115	2	20
Zinc	500	499		ug/L		100	85 - 115	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-272719/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 272742 — **Prep Batch: 272719**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/19/15 12:24	01/19/15 14:36	1

Lab Sample ID: LCS 500-272719/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 272742 — **Prep Batch: 272719**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0959		mg/L		96	90 - 110

Lab Sample ID: 180-40539-1 MS — **Client Sample ID: OC-FRAC 1- 011615**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 272742 — **Prep Batch: 272719**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0943		mg/L		94	75 - 125

Lab Sample ID: 180-40539-1 MSD — **Client Sample ID: OC-FRAC 1- 011615**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 272742 — **Prep Batch: 272719**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0935		mg/L		94	75 - 125	1	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-272692/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 272692

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/19/15 09:00	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 500-272692/2
Matrix: Water
Analysis Batch: 272692

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	180		mg/L		90	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-272635/1
Matrix: Water
Analysis Batch: 272635

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/18/15 22:25	1

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

GC/MS Semi VOA

Prep Batch: 131085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	3520C	
LCS 180-131085/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-131085/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-131085/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131157

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	8270C LL	131085
LCS 180-131085/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131085
LCSD 180-131085/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	131085
MB 180-131085/1-A	Method Blank	Total/NA	Water	8270C LL	131085

HPLC/IC

Analysis Batch: 131000

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	300.0	
LCS 180-131000/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131000/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total Recoverable	Water	200.7	
LCS 180-131309/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-131309/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-131309/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total Recoverable	Water	200.7 Rev 4.4	131309
LCS 180-131309/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131309
LCSD 180-131309/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	131309
MB 180-131309/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131309

General Chemistry

Analysis Batch: 272635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	SM 4500 Cl F	
MB 500-272635/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 272692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	SM 2540D	
LCS 500-272692/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-272692/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 272719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	Distill/Phenol	
180-40539-1 MS	OC-FRAC 1- 011615	Total/NA	Water	Distill/Phenol	
180-40539-1 MSD	OC-FRAC 1- 011615	Total/NA	Water	Distill/Phenol	
LCS 500-272719/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-272719/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 272742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40539-1	OC-FRAC 1- 011615	Total/NA	Water	420.4	272719
180-40539-1 MS	OC-FRAC 1- 011615	Total/NA	Water	420.4	272719
180-40539-1 MSD	OC-FRAC 1- 011615	Total/NA	Water	420.4	272719
LCS 500-272719/2-A	Lab Control Sample	Total/NA	Water	420.4	272719
MB 500-272719/1-A	Method Blank	Total/NA	Water	420.4	272719

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Client Sample ID: OC-FRAC 1- 011615 — **Lab Sample ID: 180-40539-1**
Date Collected: 01/16/15 10:00 — **Matrix: Water**
Date Received: 01/17/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	131085	01/19/15 09:49	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	131157	01/20/15 15:13	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		131000	01/17/15 18:23	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	131309	01/21/15 09:42	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131475	01/22/15 08:01	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	272719	01/19/15 12:24	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	272742	01/19/15 14:39	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	272692		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	01/19/15 09:10		
							(End)	01/19/15 09:12		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	272635	01/18/15 22:25	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40539-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40539-1	OC-FRAC 1- 011615	Water	01/16/15 10:00	01/17/15 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custod

180-40539 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 180-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested	
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 1- 011615	1-16-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 1-16-15	Company	Received by:
Relinquished by:	Date/Time: 1-16-15 1630	Company	Received by: Debbie Watson
Relinquished by:	Date/Time:	Company	Received by:

Date/Time:	Company
1-16-15 1111	FedEx
1-17-15	TAT
9:30	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAm
240 Bear Hi
Waltham, I
Phone (781) 180-40539 COC 66-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #: ~~500~~ 180-~~54~~40539
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978·658·6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 1- 011615	1·16·15	1000	G	Water			X		X	X	X	X	X		
				Water											

4500.cl F chloride
200.7
8270cc LL
WSNT TO
P. ttsburgh
Rest TO
Chicago.

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed i
☐ Return To Client ☐ Disposal By

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Meth

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	1·16·15			1-16-15 1111	TAC
	1-16-5 1630	TA		1/17/15 1000	TA

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.2

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40539-1

Login Number: 40539

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40539-1

Login Number: 40539

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40540-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Joseph V. Giacomazza

Authorized for release by:
1/23/2015 12:05:53 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-40540-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-40540-1

Receipt
The sample was received on 1/17/2015 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.9º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 131085. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Client Sample ID: OC-FRAC 2-011515

Lab Sample ID: 180-40540-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.37	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.16	J	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	150		5.0	0.98	mg/L	5		300.0	Total/NA
Iron	18	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.9	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	11	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Client Sample ID: OC-FRAC 2-011515
Date Collected: 01/15/15 13:30
Date Received: 01/17/15 09:30

Lab Sample ID: 180-40540-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/19/15 09:49	01/20/15 15:40	1
Butyl benzyl phthalate	**0.37**	**J**	0.94	0.13	ug/L		01/19/15 09:49	01/20/15 15:40	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		01/19/15 09:49	01/20/15 15:40	1
Diethyl phthalate	**0.16**	**J**	0.94	0.14	ug/L		01/19/15 09:49	01/20/15 15:40	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		01/19/15 09:49	01/20/15 15:40	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		01/19/15 09:49	01/20/15 15:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*54*		*16 - 122*	*01/19/15 09:49*	*01/20/15 15:40*	*1*
2-Fluorobiphenyl	*51*		*19 - 107*	*01/19/15 09:49*	*01/20/15 15:40*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 111*	*01/19/15 09:49*	*01/20/15 15:40*	*1*
Nitrobenzene-d5 (Surr)	*53*		*23 - 112*	*01/19/15 09:49*	*01/20/15 15:40*	*1*
Phenol-d5 (Surr)	*51*		*15 - 112*	*01/19/15 09:49*	*01/20/15 15:40*	*1*
Terphenyl-d14	*68*		*10 - 132*	*01/19/15 09:49*	*01/20/15 15:40*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		5.0	0.98	mg/L			01/17/15 18:38	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/21/15 09:42	01/22/15 08:06	1
Iron	**18**	**J**	50	9.5	ug/L		01/21/15 09:42	01/22/15 08:06	1
Nickel	**1.9**	**J**	10	0.51	ug/L		01/21/15 09:42	01/22/15 08:06	1
Zinc	**11**	**B**	10	1.0	ug/L		01/21/15 09:42	01/22/15 08:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0053	0.0023	mg/L		01/19/15 12:24	01/19/15 14:42	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/19/15 09:12	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/18/15 22:25	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
180-40540-1	OC-FRAC 2-011515	54	51	48	53	51	68		
LCS 180-131085/2-A	Lab Control Sample	67	66	72	75	72	66		
LCSD 180-131085/3-A	Lab Control Sample Dup	73	69	69	71	71	68		
MB 180-131085/1-A	Method Blank	65	68	73	74	74	74		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131085/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131157 — **Prep Batch: 131085**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/19/15 09:49	01/20/15 11:00	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/19/15 09:49	01/20/15 11:00	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/19/15 09:49	01/20/15 11:00	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/19/15 09:49	01/20/15 11:00	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/19/15 09:49	01/20/15 11:00	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/19/15 09:49	01/20/15 11:00	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
2-Fluorobiphenyl	*68*		*19 - 107*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
2-Fluorophenol (Surr)	*73*		*10 - 111*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Phenol-d5 (Surr)	*74*		*15 - 112*	*01/19/15 09:49*	*01/20/15 11:00*	*1*
Terphenyl-d14	*74*		*10 - 132*	*01/19/15 09:49*	*01/20/15 11:00*	*1*

Lab Sample ID: LCS 180-131085/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131157 — **Prep Batch: 131085**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.5		ug/L		72	20 - 116
Butyl benzyl phthalate	20.0	15.2		ug/L		76	36 - 108
Di-n-butyl phthalate	20.0	15.1		ug/L		76	37 - 111
Diethyl phthalate	20.0	13.8		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.7		ug/L		68	37 - 106
Di-n-octyl phthalate	20.0	15.6		ug/L		78	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*66*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*75*		*23 - 112*
Phenol-d5 (Surr)	*72*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Lab Sample ID: LCSD 180-131085/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131157 — **Prep Batch: 131085**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.3		ug/L		72	20 - 116	1	40
Butyl benzyl phthalate	20.0	15.7		ug/L		79	36 - 108	4	40
Di-n-butyl phthalate	20.0	15.5		ug/L		77	37 - 111	2	38
Diethyl phthalate	20.0	14.2		ug/L		71	36 - 109	3	39
Dimethyl phthalate	20.0	14.1		ug/L		70	37 - 106	3	42
Di-n-octyl phthalate	20.0	15.7		ug/L		78	11 - 127	0	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-131085/3-A
Matrix: Water
Analysis Batch: 131157

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131085

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol (Surr)	73		16 - 122
2-Fluorobiphenyl	69		19 - 107
2-Fluorophenol (Surr)	69		10 - 111
Nitrobenzene-d5 (Surr)	71		23 - 112
Phenol-d5 (Surr)	71		15 - 112
Terphenyl-d14	68		10 - 132

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131000/6
Matrix: Water
Analysis Batch: 131000

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			01/17/15 10:53	1

Lab Sample ID: LCS 180-131000/5
Matrix: Water
Analysis Batch: 131000

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	52.3		mg/L		105	90 - 110

Lab Sample ID: 180-40540-1 MS
Matrix: Water
Analysis Batch: 131000

Client Sample ID: OC-FRAC 2-011515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	150		125	290		mg/L		113	80 - 120

Lab Sample ID: 180-40540-1 MSD
Matrix: Water
Analysis Batch: 131000

Client Sample ID: OC-FRAC 2-011515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	150		125	287		mg/L		110	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131309/1-A
Matrix: Water
Analysis Batch: 131475

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/21/15 09:42	01/22/15 07:41	1
Iron	ND		50	9.5	ug/L		01/21/15 09:42	01/22/15 07:41	1
Nickel	ND		10	0.51	ug/L		01/21/15 09:42	01/22/15 07:41	1
Zinc	1.61	J	10	1.0	ug/L		01/21/15 09:42	01/22/15 07:41	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-131309/2-A
Matrix: Water
Analysis Batch: 131475

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	503		ug/L		101	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	488		ug/L		98	85 - 115
Zinc	500	486		ug/L		97	85 - 115

Lab Sample ID: LCSD 180-131309/3-A
Matrix: Water
Analysis Batch: 131475

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 131309

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	513		ug/L		103	85 - 115	2	20
Iron	1000	1050		ug/L		105	85 - 115	2	20
Nickel	500	500		ug/L		100	85 - 115	2	20
Zinc	500	499		ug/L		100	85 - 115	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-272719/1-A
Matrix: Water
Analysis Batch: 272742

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 272719

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/19/15 12:24	01/19/15 14:36	1

Lab Sample ID: LCS 500-272719/2-A
Matrix: Water
Analysis Batch: 272742

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 272719

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0959		mg/L		96	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-272692/1
Matrix: Water
Analysis Batch: 272692

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/19/15 09:00	1

Lab Sample ID: LCS 500-272692/2
Matrix: Water
Analysis Batch: 272692

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	180		mg/L		90	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-272635/1
Matrix: Water
Analysis Batch: 272635

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/18/15 22:25	1

Lab Sample ID: 180-40540-1 DU
Matrix: Water
Analysis Batch: 272635

Client Sample ID: OC-FRAC 2-011515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 131085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	3520C	
LCS 180-131085/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-131085/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-131085/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131157

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	8270C LL	131085
LCS 180-131085/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131085
LCSD 180-131085/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	131085
MB 180-131085/1-A	Method Blank	Total/NA	Water	8270C LL	131085

HPLC/IC

Analysis Batch: 131000

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	300.0	
180-40540-1 MS	OC-FRAC 2-011515	Total/NA	Water	300.0	
180-40540-1 MSD	OC-FRAC 2-011515	Total/NA	Water	300.0	
LCS 180-131000/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131000/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total Recoverable	Water	200.7	
LCS 180-131309/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-131309/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-131309/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total Recoverable	Water	200.7 Rev 4.4	131309
LCS 180-131309/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131309
LCSD 180-131309/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	131309
MB 180-131309/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131309

General Chemistry

Analysis Batch: 272635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	SM 4500 Cl F	
180-40540-1 DU	OC-FRAC 2-011515	Total/NA	Water	SM 4500 Cl F	
MB 500-272635/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 272692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	SM 2540D	
LCS 500-272692/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 272692 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-272692/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 272719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	Distill/Phenol	
LCS 500-272719/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-272719/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 272742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40540-1	OC-FRAC 2-011515	Total/NA	Water	420.4	272719
LCS 500-272719/2-A	Lab Control Sample	Total/NA	Water	420.4	272719
MB 500-272719/1-A	Method Blank	Total/NA	Water	420.4	272719

Client Sample ID: OC-FRAC 2-011515 — **Lab Sample ID: 180-40540-1**

Date Collected: 01/15/15 13:30 — **Matrix: Water**

Date Received: 01/17/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	131085	01/19/15 09:49	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	131157	01/20/15 15:40	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		131000	01/17/15 18:38	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	131309	01/21/15 09:42	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131475	01/22/15 08:06	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	105 mL	272719	01/19/15 12:24	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	105 mL	272742	01/19/15 14:42	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	272692		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	01/19/15 09:12		
							(End)	01/19/15 09:14		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	272635	01/18/15 22:25	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40540-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40540-1	OC-FRAC 2-011515	Water	01/15/15 13:30	01/17/15 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody R

180-40540 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	180-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	D	S	N	N	X	
FRAC2-011515	1-15-15	1330	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 1-16-15	Company	Received by:		Date/Time: 1-16-15 1115	Company TA	
Relinquished by:	Date/Time: 1-16-15	Company 1630	Received by:		Date/Time: 1-17-15	Company TAL	
Relinquished by	Date/Time:	Company	Received by:		Date/Time: 9:30	Company	

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Bo
240 Bear Hill Rd., Suite
Waltham, MA 02451
Phone (781) 466-6900 Fa

Chain of Custody Record

TestAmerica

Client Information 180-40540 COC

Client Contact: Mr. Brian Gulchard	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):
Company: Olin Corporation	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	COC No: 480-41314-10069.1
Address: 51 Eames street	Due Date Requested:		Page: Page 1 of 1
City: Wilmington	TAT Requested (days): A.S.A.P.		Job #: 180-40540
State, Zip: MA, 01887			
Phone: 978.658.6121	PO #: REWI0020		
Email: begulchard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006863		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 2. 011515	1.15.15	1330	G	Water			X		X	X	X	X	X		
				Water											

4500.Cl F chlorine
200.7
8270 cc 11
WS NT TO. Pittsburgh
REST TO Chicago.

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samp
☐ Return To Client ☐ Disposal By Lab

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Sh	
Relinquished by:	Date/Time: 1.16.15	Company	Received by:		Date/Time: 1/16-15 1115	Company TA	
Relinquished by:	Date/Time: 1-16-15	Company 1630	Received by:		Date/Time: 1/17/15 1000	Company TA	
Relinquished by	Date/Time:	Company	Received by:		Date/Time:	Company	

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.2

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40540-1

Login Number: 40540

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40540-1

Login Number: 40540

List Source: TestAmerica Pittsburgh

List Number: 2

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40619-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/26/2015 2:23:52 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Job ID: 180-40619-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 1/21/2015 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

GC/MS Semi VOA
Method 8270C LL: The method blank for batch 131341 contained Diethylphthalate and Butylbenzylphthalate above the method detection limit. These analyte concentrations were less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 131341. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Client Sample ID: OC-FRAC 4-012015

Lab Sample ID: 180-40619-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.53	J B	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.15	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	150	B	1.0	0.20	mg/L	1		300.0	Total/NA
Arsenic	4.3	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	13	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.1	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	11		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 4-012015

Date Collected: 01/20/15 10:00
Date Received: 01/21/15 10:10

Lab Sample ID: 180-40619-1

Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/21/15 12:42	01/23/15 05:15	1
Butyl benzyl phthalate	**0.53**	**J B**	0.94	0.13	ug/L		01/21/15 12:42	01/23/15 05:15	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		01/21/15 12:42	01/23/15 05:15	1
Diethyl phthalate	**0.15**	**J B**	0.94	0.14	ug/L		01/21/15 12:42	01/23/15 05:15	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		01/21/15 12:42	01/23/15 05:15	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		01/21/15 12:42	01/23/15 05:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*53*		*38 - 106*	*01/21/15 12:42*	*01/23/15 05:15*	*1*
2-Fluorobiphenyl	*62*		*39 - 100*	*01/21/15 12:42*	*01/23/15 05:15*	*1*
2-Fluorophenol (Surr)	*56*		*18 - 109*	*01/21/15 12:42*	*01/23/15 05:15*	*1*
Nitrobenzene-d5 (Surr)	*62*		*39 - 100*	*01/21/15 12:42*	*01/23/15 05:15*	*1*
Phenol-d5 (Surr)	*60*		*32 - 100*	*01/21/15 12:42*	*01/23/15 05:15*	*1*
Terphenyl-d14	*76*		*35 - 103*	*01/21/15 12:42*	*01/23/15 05:15*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**	**B**	1.0	0.20	mg/L			01/22/15 04:53	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.3**	**J**	10	3.0	ug/L		01/23/15 05:45	01/26/15 12:04	1
Iron	**13**	**J**	50	9.5	ug/L		01/23/15 05:45	01/26/15 12:04	1
Nickel	**1.1**	**J**	10	0.51	ug/L		01/23/15 05:45	01/26/15 12:04	1
Zinc	**11**		10	1.0	ug/L		01/23/15 05:45	01/26/15 12:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/22/15 15:02	01/23/15 11:08	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/21/15 14:21	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/21/15 14:36	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-40619-1	OC-FRAC 4-012015	53	62	56	62	60	76		
LCS 180-131341/2-A	Lab Control Sample	67	68	62	68	66	69		
LCSD 180-131341/3-A	Lab Control Sample Dup	62	62	59	65	64	63		
MB 180-131341/1-A	Method Blank	57	72	63	70	63	82		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131341/1-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 131341

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/21/15 12:42	01/23/15 01:05	1
Butyl benzyl phthalate	0.255	J	1.0	0.14	ug/L		01/21/15 12:42	01/23/15 01:05	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/21/15 12:42	01/23/15 01:05	1
Diethyl phthalate	0.187	J	1.0	0.15	ug/L		01/21/15 12:42	01/23/15 01:05	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/21/15 12:42	01/23/15 01:05	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/21/15 12:42	01/23/15 01:05	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*57*		*38 - 106*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
2-Fluorobiphenyl	*72*		*39 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
2-Fluorophenol (Surr)	*63*		*18 - 109*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Nitrobenzene-d5 (Surr)	*70*		*39 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Phenol-d5 (Surr)	*63*		*32 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Terphenyl-d14	*82*		*35 - 103*	*01/21/15 12:42*	*01/23/15 01:05*	*1*

Lab Sample ID: LCS 180-131341/2-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 131341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.8		ug/L		84	24 - 129
Butyl benzyl phthalate	20.0	17.0		ug/L		85	38 - 110
Di-n-butyl phthalate	20.0	16.0		ug/L		80	42 - 106
Diethyl phthalate	20.0	14.8		ug/L		74	40 - 106
Dimethyl phthalate	20.0	14.7		ug/L		73	43 - 100
Di-n-octyl phthalate	20.0	15.1		ug/L		76	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*38 - 106*
2-Fluorobiphenyl	*68*		*39 - 100*
2-Fluorophenol (Surr)	*62*		*18 - 109*
Nitrobenzene-d5 (Surr)	*68*		*39 - 100*
Phenol-d5 (Surr)	*66*		*32 - 100*
Terphenyl-d14	*69*		*35 - 103*

Lab Sample ID: LCSD 180-131341/3-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131341

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.4		ug/L		77	24 - 129	9	32
Butyl benzyl phthalate	20.0	14.9		ug/L		75	38 - 110	13	18
Di-n-butyl phthalate	20.0	14.4		ug/L		72	42 - 106	10	18
Diethyl phthalate	20.0	13.8		ug/L		69	40 - 106	7	17
Dimethyl phthalate	20.0	13.6		ug/L		68	43 - 100	7	18
Di-n-octyl phthalate	20.0	13.2		ug/L		66	31 - 111	14	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-131341/3-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131341

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*62*		*38 - 106*
2-Fluorobiphenyl	*62*		*39 - 100*
2-Fluorophenol (Surr)	*59*		*18 - 109*
Nitrobenzene-d5 (Surr)	*65*		*39 - 100*
Phenol-d5 (Surr)	*64*		*32 - 100*
Terphenyl-d14	*63*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131349/47
Matrix: Water
Analysis Batch: 131349

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.424	J	1.0	0.20	mg/L			01/22/15 04:34	1

Lab Sample ID: LCS 180-131349/46
Matrix: Water
Analysis Batch: 131349

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	52.0		mg/L		104	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131531/1-A
Matrix: Water
Analysis Batch: 131746

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131531

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/23/15 05:45	01/26/15 11:54	1
Iron	ND		50	9.5	ug/L		01/23/15 05:45	01/26/15 11:54	1
Nickel	ND		10	0.51	ug/L		01/23/15 05:45	01/26/15 11:54	1
Zinc	ND		10	1.0	ug/L		01/23/15 05:45	01/26/15 11:54	1

Lab Sample ID: LCS 180-131531/2-A
Matrix: Water
Analysis Batch: 131746

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131531

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	525		ug/L		105	85 - 115
Iron	1000	998		ug/L		100	85 - 115
Nickel	500	500		ug/L		100	85 - 115
Zinc	500	509		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-273261/1-A
Matrix: Water
Analysis Batch: 273397

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273261

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/22/15 15:02	01/23/15 11:02	1

Lab Sample ID: LCS 500-273261/2-A
Matrix: Water
Analysis Batch: 273397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273261

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0967		mg/L		97	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-273068/1
Matrix: Water
Analysis Batch: 273068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/21/15 14:15	1

Lab Sample ID: LCS 500-273068/2
Matrix: Water
Analysis Batch: 273068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	182		mg/L		91	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-273064/1
Matrix: Water
Analysis Batch: 273064

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/21/15 14:35	1

Lab Sample ID: 180-40619-1 DU
Matrix: Water
Analysis Batch: 273064

Client Sample ID: OC-FRAC 4-012015
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

GC/MS Semi VOA

Prep Batch: 131341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	3520C	
LCS 180-131341/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-131341/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-131341/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	8270C LL	131341
LCS 180-131341/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131341
LCSD 180-131341/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	131341
MB 180-131341/1-A	Method Blank	Total/NA	Water	8270C LL	131341

HPLC/IC

Analysis Batch: 131349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	300.0	
LCS 180-131349/46	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131349/47	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total Recoverable	Water	200.7	
LCS 180-131531/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-131531/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total Recoverable	Water	200.7 Rev 4.4	131531
LCS 180-131531/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131531
MB 180-131531/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131531

General Chemistry

Analysis Batch: 273064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	SM 4500 Cl F	
180-40619-1 DU	OC-FRAC 4-012015	Total/NA	Water	SM 4500 Cl F	
MB 500-273064/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 273068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	SM 2540D	
LCS 500-273068/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-273068/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 273261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	Distill/Phenol	
LCS 500-273261/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-273261/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 273397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40619-1	OC-FRAC 4-012015	Total/NA	Water	420.4	273261
LCS 500-273261/2-A	Lab Control Sample	Total/NA	Water	420.4	273261
MB 500-273261/1-A	Method Blank	Total/NA	Water	420.4	273261

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Client Sample ID: OC-FRAC 4-012015 — **Lab Sample ID: 180-40619-1**
Date Collected: 01/20/15 10:00 — **Matrix: Water**
Date Received: 01/21/15 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	131341	01/21/15 12:42	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	131517	01/23/15 05:15	FBB	TAL PIT
	Instrument ID: CH722									
Total/NA	Analysis	300.0		1	1 mL		131349	01/22/15 04:53	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	131531	01/23/15 05:45	RJR	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131746	01/26/15 12:04	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	273261	01/22/15 15:02	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	273397	01/23/15 11:08	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	273068		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 01/21/15 14:21		
								(End) 01/21/15 14:24		
Total/NA	Analysis	SM 4500 Cl F		1			273064	01/21/15 14:36	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

RJR = Ron Rosenbaum

Batch Type: Analysis

FBB = Frank Bungard

MJH = Matthew Hartman

RJG = Rob Good

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40619-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40619-1	OC-FRAC 4-012015	Water	01/20/15 10:00	01/21/15 10:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody

180-40619 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 4 - 012615	1-20-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company		Date/Time:	Company
Relinquished by: L Johnson	1-20-15		Received by:	1-20-15 1110	
Relinquished by:	1-20-15 1430	FC	Received by: Kelly Watson	1-21-15	TAP
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10:10	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

1/26/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40619-1

Login Number: 40619

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40619-1

Login Number: 40619

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-40620-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/26/2015 2:26:08 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-40620-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-40620-1

Comments
No additional comments.

Receipt
The sample was received on 1/21/2015 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

GC/MS Semi VOA
Method(s) 8270C LL: The method blank for batch 131341 contained Diethylphthalate and Butylbenzylphthalate above the method detection limit. These analyte concentrations were less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch <<131341>>. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Client Sample ID: OC-FRAC 1-011915

Lab Sample ID: 180-40620-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.51	J B	0.95	0.14	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.17	J B	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	150	B	1.0	0.20	mg/L	1		300.0	Total/NA
Arsenic	3.3	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	15	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.0	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	12		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Client Sample ID: OC-FRAC 1-011915
Date Collected: 01/19/15 14:00
Date Received: 01/21/15 10:10

Lab Sample ID: 180-40620-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/21/15 12:42	01/23/15 05:43	1
Butyl benzyl phthalate	**0.51**	**J B**	0.95	0.14	ug/L		01/21/15 12:42	01/23/15 05:43	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		01/21/15 12:42	01/23/15 05:43	1
Diethyl phthalate	**0.17**	**J B**	0.95	0.14	ug/L		01/21/15 12:42	01/23/15 05:43	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		01/21/15 12:42	01/23/15 05:43	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		01/21/15 12:42	01/23/15 05:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*50*		*38 - 106*	*01/21/15 12:42*	*01/23/15 05:43*	*1*
2-Fluorobiphenyl	*62*		*39 - 100*	*01/21/15 12:42*	*01/23/15 05:43*	*1*
2-Fluorophenol (Surr)	*58*		*18 - 109*	*01/21/15 12:42*	*01/23/15 05:43*	*1*
Nitrobenzene-d5 (Surr)	*65*		*39 - 100*	*01/21/15 12:42*	*01/23/15 05:43*	*1*
Phenol-d5 (Surr)	*59*		*32 - 100*	*01/21/15 12:42*	*01/23/15 05:43*	*1*
Terphenyl-d14	*70*		*35 - 103*	*01/21/15 12:42*	*01/23/15 05:43*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**	**B**	1.0	0.20	mg/L			01/22/15 05:12	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.3**	**J**	10	3.0	ug/L		01/23/15 05:45	01/26/15 12:09	1
Iron	**15**	**J**	50	9.5	ug/L		01/23/15 05:45	01/26/15 12:09	1
Nickel	**1.0**	**J**	10	0.51	ug/L		01/23/15 05:45	01/26/15 12:09	1
Zinc	**12**		10	1.0	ug/L		01/23/15 05:45	01/26/15 12:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/22/15 15:02	01/23/15 11:09	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/21/15 14:24	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/21/15 14:38	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-40620-1	OC-FRAC 1-011915	50	62	58	65	59	70		
LCS 180-131341/2-A	Lab Control Sample	67	68	62	68	66	69		
LCSD 180-131341/3-A	Lab Control Sample Dup	62	62	59	65	64	63		
MB 180-131341/1-A	Method Blank	57	72	63	70	63	82		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131341/1-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 131341

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/21/15 12:42	01/23/15 01:05	1
Butyl benzyl phthalate	0.255	J	1.0	0.14	ug/L		01/21/15 12:42	01/23/15 01:05	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/21/15 12:42	01/23/15 01:05	1
Diethyl phthalate	0.187	J	1.0	0.15	ug/L		01/21/15 12:42	01/23/15 01:05	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/21/15 12:42	01/23/15 01:05	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/21/15 12:42	01/23/15 01:05	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*57*		*38 - 106*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
2-Fluorobiphenyl	*72*		*39 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
2-Fluorophenol (Surr)	*63*		*18 - 109*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Nitrobenzene-d5 (Surr)	*70*		*39 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Phenol-d5 (Surr)	*63*		*32 - 100*	*01/21/15 12:42*	*01/23/15 01:05*	*1*
Terphenyl-d14	*82*		*35 - 103*	*01/21/15 12:42*	*01/23/15 01:05*	*1*

Lab Sample ID: LCS 180-131341/2-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 131341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	16.8		ug/L		84	24 - 129
Butyl benzyl phthalate	20.0	17.0		ug/L		85	38 - 110
Di-n-butyl phthalate	20.0	16.0		ug/L		80	42 - 106
Diethyl phthalate	20.0	14.8		ug/L		74	40 - 106
Dimethyl phthalate	20.0	14.7		ug/L		73	43 - 100
Di-n-octyl phthalate	20.0	15.1		ug/L		76	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*38 - 106*
2-Fluorobiphenyl	*68*		*39 - 100*
2-Fluorophenol (Surr)	*62*		*18 - 109*
Nitrobenzene-d5 (Surr)	*68*		*39 - 100*
Phenol-d5 (Surr)	*66*		*32 - 100*
Terphenyl-d14	*69*		*35 - 103*

Lab Sample ID: LCSD 180-131341/3-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131341

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.4		ug/L		77	24 - 129	9	32
Butyl benzyl phthalate	20.0	14.9		ug/L		75	38 - 110	13	18
Di-n-butyl phthalate	20.0	14.4		ug/L		72	42 - 106	10	18
Diethyl phthalate	20.0	13.8		ug/L		69	40 - 106	7	17
Dimethyl phthalate	20.0	13.6		ug/L		68	43 - 100	7	18
Di-n-octyl phthalate	20.0	13.2		ug/L		66	31 - 111	14	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-131341/3-A
Matrix: Water
Analysis Batch: 131517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 131341

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*62*		*38 - 106*
2-Fluorobiphenyl	*62*		*39 - 100*
2-Fluorophenol (Surr)	*59*		*18 - 109*
Nitrobenzene-d5 (Surr)	*65*		*39 - 100*
Phenol-d5 (Surr)	*64*		*32 - 100*
Terphenyl-d14	*63*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131349/47
Matrix: Water
Analysis Batch: 131349

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.424	J	1.0	0.20	mg/L			01/22/15 04:34	1

Lab Sample ID: LCS 180-131349/46
Matrix: Water
Analysis Batch: 131349

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	52.0		mg/L		104	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131531/1-A
Matrix: Water
Analysis Batch: 131746

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131531

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/23/15 05:45	01/26/15 11:54	1
Iron	ND		50	9.5	ug/L		01/23/15 05:45	01/26/15 11:54	1
Nickel	ND		10	0.51	ug/L		01/23/15 05:45	01/26/15 11:54	1
Zinc	ND		10	1.0	ug/L		01/23/15 05:45	01/26/15 11:54	1

Lab Sample ID: LCS 180-131531/2-A
Matrix: Water
Analysis Batch: 131746

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131531

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	525		ug/L		105	85 - 115
Iron	1000	998		ug/L		100	85 - 115
Nickel	500	500		ug/L		100	85 - 115
Zinc	500	509		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-273261/1-A
Matrix: Water
Analysis Batch: 273397

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273261

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/22/15 15:02	01/23/15 11:02	1

Lab Sample ID: LCS 500-273261/2-A
Matrix: Water
Analysis Batch: 273397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273261

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0967		mg/L		97	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-273068/1
Matrix: Water
Analysis Batch: 273068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/21/15 14:15	1

Lab Sample ID: LCS 500-273068/2
Matrix: Water
Analysis Batch: 273068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	182		mg/L		91	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-273064/1
Matrix: Water
Analysis Batch: 273064

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/21/15 14:35	1

GC/MS Semi VOA

Prep Batch: 131341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	3520C	
LCS 180-131341/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-131341/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-131341/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	8270C LL	131341
LCS 180-131341/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131341
LCSD 180-131341/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	131341
MB 180-131341/1-A	Method Blank	Total/NA	Water	8270C LL	131341

HPLC/IC

Analysis Batch: 131349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	300.0	
LCS 180-131349/46	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131349/47	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total Recoverable	Water	200.7	
LCS 180-131531/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-131531/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total Recoverable	Water	200.7 Rev 4.4	131531
LCS 180-131531/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131531
MB 180-131531/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131531

General Chemistry

Analysis Batch: 273064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	SM 4500 Cl F	
MB 500-273064/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 273068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	SM 2540D	
LCS 500-273068/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-273068/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 273261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 273261 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-273261/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-273261/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 273397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40620-1	OC-FRAC 1-011915	Total/NA	Water	420.4	273261
LCS 500-273261/2-A	Lab Control Sample	Total/NA	Water	420.4	273261
MB 500-273261/1-A	Method Blank	Total/NA	Water	420.4	273261

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Client Sample ID: OC-FRAC 1-011915
Date Collected: 01/19/15 14:00
Date Received: 01/21/15 10:10

Lab Sample ID: 180-40620-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1050 mL	1.0 mL	131341	01/21/15 12:42	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1050 mL	1.0 mL	131517	01/23/15 05:43	FBB	TAL PIT
	Instrument ID: CH722									
Total/NA	Analysis	300.0		1	1 mL		131349	01/22/15 05:12	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	131531	01/23/15 05:45	RJR	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131746	01/26/15 12:09	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	273261	01/22/15 15:02	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	273397	01/23/15 11:09	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	273068		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 01/21/15 14:24		
								(End) 01/21/15 14:27		
Total/NA	Analysis	SM 4500 Cl F		1			273064	01/21/15 14:38	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

RJR = Ron Rosenbaum

Batch Type: Analysis

FBB = Frank Bungard

MJH = Matthew Hartman

RJG = Rob Good

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40620-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40620-1	OC-FRAC 1-011915	Water	01/19/15 14:00	01/21/15 10:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody

180-40620 Chain of Custody

estAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC1-011915	1-19-15	1400	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	1-20-15			1-20-15 1110	
Relinquished by:	1-20-15 1430		Debbie Watson	1-21-15 10:10	TAP
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

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1/26/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40620-1

Login Number: 40620

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40620-1

Login Number: 40620

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40697-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/29/2015 11:46:17 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-40697-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt

The sample was received on 1/23/2015 8:55 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.5º C.

GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Client Sample ID: OC-FRAC 4-012215

Lab Sample ID: 180-40697-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl phthalate	0.15	J	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	150	B	1.0	0.20	mg/L	1		300.0	Total/NA
Iron	16	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.4	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	12		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Client Sample ID: OC-FRAC 4-012215
Date Collected: 01/22/15 10:00
Date Received: 01/23/15 08:55

Lab Sample ID: 180-40697-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		01/23/15 11:40	01/28/15 10:27	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		01/23/15 11:40	01/28/15 10:27	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		01/23/15 11:40	01/28/15 10:27	1
Diethyl phthalate	**0.15**	**J**	0.95	0.14	ug/L		01/23/15 11:40	01/28/15 10:27	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		01/23/15 11:40	01/28/15 10:27	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		01/23/15 11:40	01/28/15 10:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*64*		*38 - 106*	*01/23/15 11:40*	*01/28/15 10:27*	*1*
2-Fluorobiphenyl	*68*		*39 - 100*	*01/23/15 11:40*	*01/28/15 10:27*	*1*
2-Fluorophenol (Surr)	*61*		*18 - 109*	*01/23/15 11:40*	*01/28/15 10:27*	*1*
Nitrobenzene-d5 (Surr)	*67*		*39 - 100*	*01/23/15 11:40*	*01/28/15 10:27*	*1*
Phenol-d5 (Surr)	*61*		*32 - 100*	*01/23/15 11:40*	*01/28/15 10:27*	*1*
Terphenyl-d14	*79*		*35 - 103*	*01/23/15 11:40*	*01/28/15 10:27*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**	**B**	1.0	0.20	mg/L			01/23/15 12:59	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/26/15 09:00	01/27/15 10:07	1
Iron	**16**	**J**	50	9.5	ug/L		01/26/15 09:00	01/27/15 10:07	1
Nickel	**1.4**	**J**	10	0.51	ug/L		01/26/15 09:00	01/27/15 10:07	1
Zinc	**12**		10	1.0	ug/L		01/26/15 09:00	01/27/15 10:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/26/15 16:26	01/27/15 08:59	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/23/15 14:04	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/23/15 14:06	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-40697-1	OC-FRAC 4-012215	64	68	61	67	61	79		
LCS 180-131571/2-A	Lab Control Sample	80	70	62	67	66	69		
MB 180-131571/1-A	Method Blank	61	72	67	72	71	78		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131571/1-A
Matrix: Water
Analysis Batch: 131871

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 131571

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/23/15 08:58	01/28/15 09:33	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/23/15 08:58	01/28/15 09:33	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/23/15 08:58	01/28/15 09:33	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/23/15 08:58	01/28/15 09:33	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/23/15 08:58	01/28/15 09:33	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/23/15 08:58	01/28/15 09:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*38 - 106*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
2-Fluorobiphenyl	*72*		*39 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
2-Fluorophenol (Surr)	*67*		*18 - 109*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Nitrobenzene-d5 (Surr)	*72*		*39 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Phenol-d5 (Surr)	*71*		*32 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Terphenyl-d14	*78*		*35 - 103*	*01/23/15 08:58*	*01/28/15 09:33*	*1*

Lab Sample ID: LCS 180-131571/2-A
Matrix: Water
Analysis Batch: 131871

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 131571

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.7		ug/L		78	24 - 129
Butyl benzyl phthalate	20.0	15.5		ug/L		77	38 - 110
Di-n-butyl phthalate	20.0	16.0		ug/L		80	42 - 106
Diethyl phthalate	20.0	14.6		ug/L		73	40 - 106
Dimethyl phthalate	20.0	15.0		ug/L		75	43 - 100
Di-n-octyl phthalate	20.0	15.3		ug/L		76	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*80*		*38 - 106*
2-Fluorobiphenyl	*70*		*39 - 100*
2-Fluorophenol (Surr)	*62*		*18 - 109*
Nitrobenzene-d5 (Surr)	*67*		*39 - 100*
Phenol-d5 (Surr)	*66*		*32 - 100*
Terphenyl-d14	*69*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131594/6
Matrix: Water
Analysis Batch: 131594

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.476	J	1.0	0.20	mg/L			01/23/15 12:39	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-131594/5
Matrix: Water
Analysis Batch: 131594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.9		mg/L		96	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131699/1-A
Matrix: Water
Analysis Batch: 131831

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131699

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/26/15 09:00	01/27/15 09:37	1
Iron	ND		50	9.5	ug/L		01/26/15 09:00	01/27/15 09:37	1
Nickel	ND		10	0.51	ug/L		01/26/15 09:00	01/27/15 09:37	1
Zinc	ND		10	1.0	ug/L		01/26/15 09:00	01/27/15 09:37	1

Lab Sample ID: LCS 180-131699/2-A
Matrix: Water
Analysis Batch: 131831

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131699

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	529		ug/L		106	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	509		ug/L		102	85 - 115
Zinc	500	512		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-273649/1-A
Matrix: Water
Analysis Batch: 273722

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		01/26/15 16:26	01/27/15 08:57	1

Lab Sample ID: LCS 500-273649/2-A
Matrix: Water
Analysis Batch: 273722

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0983		mg/L		98	90 - 110

Lab Sample ID: 180-40697-1 MS
Matrix: Water
Analysis Batch: 273722

Client Sample ID: OC-FRAC 4-012215
Prep Type: Total/NA
Prep Batch: 273649

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0912		mg/L		91	75 - 125

Method: 420.4 - Phenolics, Total Recoverable (Continued)

Lab Sample ID: 180-40697-1 MSD — **Client Sample ID: OC-FRAC 4-012215**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 273722 — **Prep Batch: 273649**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0954		mg/L		95	75 - 125	4	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-273426/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 273426

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/23/15 13:30	1

Lab Sample ID: LCS 500-273426/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 273426

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	205		mg/L		103	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-273427/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 273427

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/23/15 14:05	1

Lab Sample ID: 180-40697-1 DU — **Client Sample ID: OC-FRAC 4-012215**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 273427

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 131571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	3520C	
LCS 180-131571/2-A	Lab Control Sample	Total/NA	Water	3520C	
MB 180-131571/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	8270C LL	131571
LCS 180-131571/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131571
MB 180-131571/1-A	Method Blank	Total/NA	Water	8270C LL	131571

HPLC/IC

Analysis Batch: 131594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	300.0	
LCS 180-131594/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131594/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total Recoverable	Water	200.7	
LCS 180-131699/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-131699/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total Recoverable	Water	200.7 Rev 4.4	131699
LCS 180-131699/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131699
MB 180-131699/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131699

General Chemistry

Analysis Batch: 273426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	SM 2540D	
LCS 500-273426/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-273426/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 273427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	SM 4500 Cl F	
180-40697-1 DU	OC-FRAC 4-012215	Total/NA	Water	SM 4500 Cl F	
MB 500-273427/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 273649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	Distill/Phenol	
180-40697-1 MS	OC-FRAC 4-012215	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 273649 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1 MSD	OC-FRAC 4-012215	Total/NA	Water	Distill/Phenol	
LCS 500-273649/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-273649/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 273722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40697-1	OC-FRAC 4-012215	Total/NA	Water	420.4	273649
180-40697-1 MS	OC-FRAC 4-012215	Total/NA	Water	420.4	273649
180-40697-1 MSD	OC-FRAC 4-012215	Total/NA	Water	420.4	273649
LCS 500-273649/2-A	Lab Control Sample	Total/NA	Water	420.4	273649
MB 500-273649/1-A	Method Blank	Total/NA	Water	420.4	273649

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Client Sample ID: OC-FRAC 4-012215
Date Collected: 01/22/15 10:00
Date Received: 01/23/15 08:55

Lab Sample ID: 180-40697-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1050 mL	1.0 mL	131571	01/23/15 11:40	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1050 mL	1.0 mL	131871	01/28/15 10:27	SAB	TAL PIT
	Instrument ID: CH71									
Total/NA	Analysis	300.0		1	1 mL		131594	01/23/15 12:59	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	131699	01/26/15 09:00	RJR	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131831	01/27/15 10:07	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	273649	01/26/15 16:26	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	273722	01/27/15 08:59	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	273426		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	01/23/15 14:04		
							(End)	01/23/15 14:06		
Total/NA	Analysis	SM 4500 Cl F		1			273427	01/23/15 14:06	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

RJR = Ron Rosenbaum

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40697-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40697-1	OC-FRAC 4-012215	Water	01/22/15 10:00	01/23/15 08:55

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody F

180-40697 Chain of Custody

stAmerica

Client Information

Sampler: L Johnson
Lab PM: Mason, Becky C
Phone: 978 658 6121
E-Mail: becky.mason@testamericainc.com
Page: Page 1 of 1
Job #:

Client Contact: Mr. Brian Guichard
Company: Olin Corporation
Address: 51 Eames street
City: Wilmington
State, Zip: MA, 01887
Phone: 978-658-6121
Email: beguichard@olin.com
Project Name: Wilmington Plant B RPG
Site:

Due Date Requested:
TAT Requested (days): A.S.A.P.
PO #: REWI0020
WO #:
Project #: 48006853
SSOW#:

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
Frac 9 - 012215	1-22-15	1000	G	Water			X		X	X	X	XX			
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time:	Company		Date/Time:	Company
Relinquished by: L Johnson	1-22-15		Received by:	1-22-15 1130	TA
Relinquished by:	1-22-15 1630	TA	Received by: Debbie Watson	1-23-15	TAP
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 8:55	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40697-1

Login Number: 40697

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40698-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
1/29/2015 11:49:31 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Job ID: 180-40698-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 1/23/2015 8:55 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.5º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Client Sample ID: OC-INF 012215

Lab Sample ID: 180-40698-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	4.0		1.9	1.2	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.15	J	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	160	B	1.0	0.20	mg/L	1		300.0	Total/NA
Arsenic	12		10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	7100		50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.2	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	4.5	J	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-INF 012215

Date Collected: 01/22/15 08:00
Date Received: 01/23/15 08:55

Lab Sample ID: 180-40698-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**4.0**		1.9	1.2	ug/L		01/23/15 11:40	01/28/15 10:54	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		01/23/15 11:40	01/28/15 10:54	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		01/23/15 11:40	01/28/15 10:54	1
Diethyl phthalate	**0.15**	**J**	0.95	0.14	ug/L		01/23/15 11:40	01/28/15 10:54	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		01/23/15 11:40	01/28/15 10:54	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		01/23/15 11:40	01/28/15 10:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*83*		*38 - 106*	*01/23/15 11:40*	*01/28/15 10:54*	*1*
2-Fluorobiphenyl	*63*		*39 - 100*	*01/23/15 11:40*	*01/28/15 10:54*	*1*
2-Fluorophenol (Surr)	*55*		*18 - 109*	*01/23/15 11:40*	*01/28/15 10:54*	*1*
Nitrobenzene-d5 (Surr)	*64*		*39 - 100*	*01/23/15 11:40*	*01/28/15 10:54*	*1*
Phenol-d5 (Surr)	*57*		*32 - 100*	*01/23/15 11:40*	*01/28/15 10:54*	*1*
Terphenyl-d14	*61*		*35 - 103*	*01/23/15 11:40*	*01/28/15 10:54*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**	**B**	1.0	0.20	mg/L			01/23/15 13:18	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**12**		10	3.0	ug/L		01/26/15 09:00	01/27/15 10:13	1
Iron	**7100**		50	9.5	ug/L		01/26/15 09:00	01/27/15 10:13	1
Nickel	**1.2**	**J**	10	0.51	ug/L		01/26/15 09:00	01/27/15 10:13	1
Zinc	**4.5**	**J**	10	1.0	ug/L		01/26/15 09:00	01/27/15 10:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		01/26/15 16:26	01/27/15 09:03	1
Total Suspended Solids	ND		5.0	1.6	mg/L			01/23/15 14:06	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			01/23/15 14:08	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-40698-1	OC-INF 012215	83	63	55	64	57	61		
LCS 180-131571/2-A	Lab Control Sample	80	70	62	67	66	69		
MB 180-131571/1-A	Method Blank	61	72	67	72	71	78		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-131571/1-A
Matrix: Water
Analysis Batch: 131871

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 131571

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		01/23/15 08:58	01/28/15 09:33	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		01/23/15 08:58	01/28/15 09:33	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		01/23/15 08:58	01/28/15 09:33	1
Diethyl phthalate	ND		1.0	0.15	ug/L		01/23/15 08:58	01/28/15 09:33	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		01/23/15 08:58	01/28/15 09:33	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		01/23/15 08:58	01/28/15 09:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*38 - 106*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
2-Fluorobiphenyl	*72*		*39 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
2-Fluorophenol (Surr)	*67*		*18 - 109*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Nitrobenzene-d5 (Surr)	*72*		*39 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Phenol-d5 (Surr)	*71*		*32 - 100*	*01/23/15 08:58*	*01/28/15 09:33*	*1*
Terphenyl-d14	*78*		*35 - 103*	*01/23/15 08:58*	*01/28/15 09:33*	*1*

Lab Sample ID: LCS 180-131571/2-A
Matrix: Water
Analysis Batch: 131871

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 131571

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.7		ug/L		78	24 - 129
Butyl benzyl phthalate	20.0	15.5		ug/L		77	38 - 110
Di-n-butyl phthalate	20.0	16.0		ug/L		80	42 - 106
Diethyl phthalate	20.0	14.6		ug/L		73	40 - 106
Dimethyl phthalate	20.0	15.0		ug/L		75	43 - 100
Di-n-octyl phthalate	20.0	15.3		ug/L		76	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*80*		*38 - 106*
2-Fluorobiphenyl	*70*		*39 - 100*
2-Fluorophenol (Surr)	*62*		*18 - 109*
Nitrobenzene-d5 (Surr)	*67*		*39 - 100*
Phenol-d5 (Surr)	*66*		*32 - 100*
Terphenyl-d14	*69*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-131594/6
Matrix: Water
Analysis Batch: 131594

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.476	J	1.0	0.20	mg/L			01/23/15 12:39	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-131594/5
Matrix: Water
Analysis Batch: 131594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	47.9		mg/L		96	90 - 110		

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-131699/1-A
Matrix: Water
Analysis Batch: 131831

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131699

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		01/26/15 09:00	01/27/15 09:37	1
Iron	ND		50	9.5	ug/L		01/26/15 09:00	01/27/15 09:37	1
Nickel	ND		10	0.51	ug/L		01/26/15 09:00	01/27/15 09:37	1
Zinc	ND		10	1.0	ug/L		01/26/15 09:00	01/27/15 09:37	1

Lab Sample ID: LCS 180-131699/2-A
Matrix: Water
Analysis Batch: 131831

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131699

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			500	529		ug/L		106	85 - 115		
Iron			1000	1020		ug/L		102	85 - 115		
Nickel			500	509		ug/L		102	85 - 115		
Zinc			500	512		ug/L		102	85 - 115		

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-273649/1-A
Matrix: Water
Analysis Batch: 273722

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 273649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		01/26/15 16:26	01/27/15 08:57	1

Lab Sample ID: LCS 500-273649/2-A
Matrix: Water
Analysis Batch: 273722

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 273649

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Phenolics, Total Recoverable			0.100	0.0983		mg/L		98	90 - 110		

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-273426/1
Matrix: Water
Analysis Batch: 273426

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			01/23/15 13:30	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 500-273426/2
Matrix: Water
Analysis Batch: 273426

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	205		mg/L		103	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-273427/1
Matrix: Water
Analysis Batch: 273427

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			01/23/15 14:05	1

GC/MS Semi VOA

Prep Batch: 131571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	3520C	
LCS 180-131571/2-A	Lab Control Sample	Total/NA	Water	3520C	
MB 180-131571/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 131871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	8270C LL	131571
LCS 180-131571/2-A	Lab Control Sample	Total/NA	Water	8270C LL	131571
MB 180-131571/1-A	Method Blank	Total/NA	Water	8270C LL	131571

HPLC/IC

Analysis Batch: 131594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	300.0	
LCS 180-131594/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-131594/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 131699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total Recoverable	Water	200.7	
LCS 180-131699/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-131699/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 131831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total Recoverable	Water	200.7 Rev 4.4	131699
LCS 180-131699/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	131699
MB 180-131699/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	131699

General Chemistry

Analysis Batch: 273426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	SM 2540D	
LCS 500-273426/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-273426/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 273427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	SM 4500 Cl F	
MB 500-273427/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 273649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	Distill/Phenol	
LCS 500-273649/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-273649/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Analysis Batch: 273722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40698-1	OC-INF 012215	Total/NA	Water	420.4	273649
LCS 500-273649/2-A	Lab Control Sample	Total/NA	Water	420.4	273649
MB 500-273649/1-A	Method Blank	Total/NA	Water	420.4	273649

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Client Sample ID: OC-INF 012215
Date Collected: 01/22/15 08:00
Date Received: 01/23/15 08:55

Lab Sample ID: 180-40698-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1050 mL	1.0 mL	131571	01/23/15 11:40	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1050 mL	1.0 mL	131871	01/28/15 10:54	SAB	TAL PIT
	Instrument ID: CH71									
Total/NA	Analysis	300.0		1	1 mL		131594	01/23/15 13:18	MJH	TAL PIT
	Instrument ID: CHICS2000									
Total Recoverable	Prep	200.7			50 mL	50 mL	131699	01/26/15 09:00	RJR	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	131831	01/27/15 10:13	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	273649	01/26/15 16:26	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	273722	01/27/15 09:03	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	273426		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	01/23/15 14:06		
							(End)	01/23/15 14:08		
Total/NA	Analysis	SM 4500 Cl F		1			273427	01/23/15 14:08	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

BJT = Bill Trout

RJR = Ron Rosenbaum

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15 *
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40698-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40698-1	OC-INF 012215	Water	01/22/15 08:00	01/23/15 08:55

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Re

180-40698 Chain of Custody

America

Client Information

Client Contact: Mr. Brian Guichard	Sampler: L Johnson	Lab PM: Mason, Becky C	-10069.1
Company: Olin Corporation	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Address: 51 Eames street	Due Date Requested:		Job #:
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887	PO #: REWI0020		
Phone: 978-658-6121	WO #:		
Email: beguichard@olin.com	Project #: 48006853		
Project Name: Wilmington Plant B RPG	SSOW#:		
Site:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
INF 012215	1-22-15	0800	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 1-22-15	Company	Received by:	Date/Time: 1-22-15 1130	Company
Relinquished by:	Date/Time: 1-22-15 1630	Company TA	Received by: Debbie Watson	Date/Time: 1-23-15 8:55	Company TA
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40698-1

Login Number: 40698

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-40903-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/6/2015 1:03:38 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Client Sample ID: OC-FRAC 5-013015

Lab Sample ID: 180-40903-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Di-n-butyl phthalate	0.20	J	0.97	0.12	ug/L	1		8270C LL	Total/NA
Chloride	150		2.5	0.49	mg/L	2.5		300.0	Total/NA
Arsenic	3.1	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	15	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.3	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	11		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Client Sample ID: OC-FRAC 5-013015
Date Collected: 01/30/15 10:00
Date Received: 01/31/15 09:00

Lab Sample ID: 180-40903-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		02/02/15 08:56	02/06/15 05:46	1
Butyl benzyl phthalate	ND		0.97	0.14	ug/L		02/02/15 08:56	02/06/15 05:46	1
Di-n-butyl phthalate	**0.20**	**J**	0.97	0.12	ug/L		02/02/15 08:56	02/06/15 05:46	1
Diethyl phthalate	ND		0.97	0.14	ug/L		02/02/15 08:56	02/06/15 05:46	1
Dimethyl phthalate	ND		0.97	0.074	ug/L		02/02/15 08:56	02/06/15 05:46	1
Di-n-octyl phthalate	ND		0.97	0.20	ug/L		02/02/15 08:56	02/06/15 05:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*52*		*38 - 106*	*02/02/15 08:56*	*02/06/15 05:46*	*1*
2-Fluorobiphenyl	*64*		*39 - 100*	*02/02/15 08:56*	*02/06/15 05:46*	*1*
2-Fluorophenol (Surr)	*56*		*18 - 109*	*02/02/15 08:56*	*02/06/15 05:46*	*1*
Nitrobenzene-d5 (Surr)	*59*		*39 - 100*	*02/02/15 08:56*	*02/06/15 05:46*	*1*
Phenol-d5 (Surr)	*61*		*32 - 100*	*02/02/15 08:56*	*02/06/15 05:46*	*1*
Terphenyl-d14	*71*		*35 - 103*	*02/02/15 08:56*	*02/06/15 05:46*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		2.5	0.49	mg/L			02/03/15 19:19	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.1**	**J**	10	3.0	ug/L		02/03/15 09:04	02/04/15 13:09	1
Iron	**15**	**J**	50	9.5	ug/L		02/03/15 09:04	02/04/15 13:09	1
Nickel	**1.3**	**J**	10	0.51	ug/L		02/03/15 09:04	02/04/15 13:09	1
Zinc	**11**		10	1.0	ug/L		02/03/15 09:04	02/04/15 13:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/03/15 12:29	02/03/15 13:07	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/03/15 12:09	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			02/02/15 01:03	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-40903-1	OC-FRAC 5-013015	52	64	56	59	61	71		
LCS 180-132336/2-A	Lab Control Sample	56	56	36	50	45	70		
LCSD 180-132336/3-A	Lab Control Sample Dup	55	59	43	52	49	65		
MB 180-132336/1-A	Method Blank	45	58	51	55	54	81		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-132336/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132815 — **Prep Batch: 132336**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/02/15 08:56	02/06/15 00:50	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/02/15 08:56	02/06/15 00:50	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/02/15 08:56	02/06/15 00:50	1
Diethyl phthalate	ND		1.0	0.15	ug/L		02/02/15 08:56	02/06/15 00:50	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/02/15 08:56	02/06/15 00:50	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/02/15 08:56	02/06/15 00:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*45*		*38 - 106*	*02/02/15 08:56*	*02/06/15 00:50*	*1*
2-Fluorobiphenyl	*58*		*39 - 100*	*02/02/15 08:56*	*02/06/15 00:50*	*1*
2-Fluorophenol (Surr)	*51*		*18 - 109*	*02/02/15 08:56*	*02/06/15 00:50*	*1*
Nitrobenzene-d5 (Surr)	*55*		*39 - 100*	*02/02/15 08:56*	*02/06/15 00:50*	*1*
Phenol-d5 (Surr)	*54*		*32 - 100*	*02/02/15 08:56*	*02/06/15 00:50*	*1*
Terphenyl-d14	*81*		*35 - 103*	*02/02/15 08:56*	*02/06/15 00:50*	*1*

Lab Sample ID: LCS 180-132336/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132815 — **Prep Batch: 132336**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	17.3		ug/L		86	24 - 129
Butyl benzyl phthalate	20.0	17.8		ug/L		89	38 - 110
Di-n-butyl phthalate	20.0	15.4		ug/L		77	42 - 106
Diethyl phthalate	20.0	13.2		ug/L		66	40 - 106
Dimethyl phthalate	20.0	14.5		ug/L		72	43 - 100
Di-n-octyl phthalate	20.0	19.0		ug/L		95	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*56*		*38 - 106*
2-Fluorobiphenyl	*56*		*39 - 100*
2-Fluorophenol (Surr)	*36*		*18 - 109*
Nitrobenzene-d5 (Surr)	*50*		*39 - 100*
Phenol-d5 (Surr)	*45*		*32 - 100*
Terphenyl-d14	*70*		*35 - 103*

Lab Sample ID: LCSD 180-132336/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132815 — **Prep Batch: 132336**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	16.8		ug/L		84	24 - 129	3	32
Butyl benzyl phthalate	20.0	16.3		ug/L		81	38 - 110	9	18
Di-n-butyl phthalate	20.0	14.3		ug/L		71	42 - 106	7	18
Diethyl phthalate	20.0	12.6		ug/L		63	40 - 106	4	17
Dimethyl phthalate	20.0	14.5		ug/L		72	43 - 100	0	18
Di-n-octyl phthalate	20.0	18.3		ug/L		92	31 - 111	3	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-132336/3-A
Matrix: Water
Analysis Batch: 132815

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 132336

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*55*		*38 - 106*
2-Fluorobiphenyl	*59*		*39 - 100*
2-Fluorophenol (Surr)	*43*		*18 - 109*
Nitrobenzene-d5 (Surr)	*52*		*39 - 100*
Phenol-d5 (Surr)	*49*		*32 - 100*
Terphenyl-d14	*65*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-132513/6
Matrix: Water
Analysis Batch: 132513

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			02/03/15 11:57	1

Lab Sample ID: LCS 180-132513/5
Matrix: Water
Analysis Batch: 132513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.4		mg/L		103	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-132469/1-A
Matrix: Water
Analysis Batch: 132675

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 132469

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/03/15 09:04	02/04/15 12:54	1
Iron	ND		50	9.5	ug/L		02/03/15 09:04	02/04/15 12:54	1
Nickel	ND		10	0.51	ug/L		02/03/15 09:04	02/04/15 12:54	1
Zinc	ND		10	1.0	ug/L		02/03/15 09:04	02/04/15 12:54	1

Lab Sample ID: LCS 180-132469/2-A
Matrix: Water
Analysis Batch: 132675

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 132469

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	528		ug/L		106	85 - 115
Iron	1000	1000		ug/L		100	85 - 115
Nickel	500	508		ug/L		102	85 - 115
Zinc	500	517		ug/L		103	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-132469/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 132675 — **Prep Batch: 132469**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	527		ug/L		105	85 - 115	0	20
Iron	1000	1000		ug/L		100	85 - 115	0	20
Nickel	500	506		ug/L		101	85 - 115	0	20
Zinc	500	514		ug/L		103	85 - 115	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-274430/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 274442 — **Prep Batch: 274430**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0053	0.0023	mg/L		02/03/15 12:29	02/03/15 13:04	1

Lab Sample ID: LCS 500-274430/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 274442 — **Prep Batch: 274430**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.101		mg/L		101	90 - 110

Lab Sample ID: 180-40903-1 MS — **Client Sample ID: OC-FRAC 5-013015**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 274442 — **Prep Batch: 274430**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0652	F1	mg/L		65	75 - 125

Lab Sample ID: 180-40903-1 MSD — **Client Sample ID: OC-FRAC 5-013015**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 274442 — **Prep Batch: 274430**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0964	F2	mg/L		96	75 - 125	39	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-274431/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 274431

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/03/15 11:45	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 500-274431/2
Matrix: Water
Analysis Batch: 274431

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	195		mg/L		97	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-274359/1
Matrix: Water
Analysis Batch: 274359

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/02/15 01:00	1

Lab Sample ID: 180-40903-1 DU
Matrix: Water
Analysis Batch: 274359

Client Sample ID: OC-FRAC 5-013015
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 132336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	3520C	
LCS 180-132336/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-132336/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-132336/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 132815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	8270C LL	132336
LCS 180-132336/2-A	Lab Control Sample	Total/NA	Water	8270C LL	132336
LCSD 180-132336/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	132336
MB 180-132336/1-A	Method Blank	Total/NA	Water	8270C LL	132336

HPLC/IC

Analysis Batch: 132513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	300.0	
LCS 180-132513/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-132513/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 132469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total Recoverable	Water	200.7	
LCS 180-132469/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-132469/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-132469/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 132675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total Recoverable	Water	200.7 Rev 4.4	132469
LCS 180-132469/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	132469
LCSD 180-132469/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	132469
MB 180-132469/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	132469

General Chemistry

Analysis Batch: 274359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	SM 4500 Cl F	
180-40903-1 DU	OC-FRAC 5-013015	Total/NA	Water	SM 4500 Cl F	
MB 500-274359/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 274430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	Distill/Phenol	
180-40903-1 MS	OC-FRAC 5-013015	Total/NA	Water	Distill/Phenol	
180-40903-1 MSD	OC-FRAC 5-013015	Total/NA	Water	Distill/Phenol	
LCS 500-274430/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 274430 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-274430/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 274431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	SM 2540D	
LCS 500-274431/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-274431/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 274442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-40903-1	OC-FRAC 5-013015	Total/NA	Water	420.4	274430
180-40903-1 MS	OC-FRAC 5-013015	Total/NA	Water	420.4	274430
180-40903-1 MSD	OC-FRAC 5-013015	Total/NA	Water	420.4	274430
LCS 500-274430/2-A	Lab Control Sample	Total/NA	Water	420.4	274430
MB 500-274430/1-A	Method Blank	Total/NA	Water	420.4	274430

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Client Sample ID: OC-FRAC 5-013015
Date Collected: 01/30/15 10:00
Date Received: 01/31/15 09:00

Lab Sample ID: 180-40903-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1030 mL	1.0 mL	132336	02/02/15 08:56	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1030 mL	1.0 mL	132815	02/06/15 05:46	SAB	TAL PIT
	Instrument ID: CH71									
Total/NA	Analysis	300.0		2.5	1 mL		132513	02/03/15 19:19	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	132469	02/03/15 09:04	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	132675	02/04/15 13:09	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	274430	02/03/15 12:29	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	274442	02/03/15 13:07	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	274431		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 02/03/15 12:09		
								(End) 02/03/15 12:12		
Total/NA	Analysis	SM 4500 Cl F		1			274359	02/02/15 01:03	SJS	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

SJS = Sean Salmi

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

CMR = Carl Reagle

RJG = Rob Good

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15 *
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-40903-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-40903-1	OC-FRAC 5-013015	Water	01/30/15 10:00	01/31/15 09:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody R

180-40903 Chain of Custody

stAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNa02
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	~~[illegible]~~	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC5 · 013015	1-30-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	1-30-15		[signature]	1-30-15 1100	TA
[signature]	1-30-15 - 1700	TA	[signature] Walton	1-31-15 9:00	TAP

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40903-1

Login Number: 40903

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-40903-1

Login Number: 40903

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
6/29/15

TestAmerica Job ID: 180-41077-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/11/2015 9:15:38 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Job ID: 180-41077-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/6/2015 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 132856. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Client Sample ID: OC-FRAC 2-020515

Lab Sample ID: 180-41077-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	1.2	J	1.9	1.2	ug/L	1		8270C LL	Total/NA
Butyl benzyl phthalate	1.1		0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.16	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Di-n-octyl phthalate	0.64	J	0.94	0.19	ug/L	1		8270C LL	Total/NA
Chloride	160		2.5	0.49	mg/L	2.5		300.0	Total/NA
Iron	12	J	50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	2.2	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	15		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Client Sample ID: OC-FRAC 2-020515
Date Collected: 02/05/15 09:45
Date Received: 02/06/15 09:30

Lab Sample ID: 180-41077-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**1.2**	**J**	1.9	1.2	ug/L		02/06/15 12:09	02/09/15 13:32	1
Butyl benzyl phthalate	**1.1**		0.94	0.13	ug/L		02/06/15 12:09	02/09/15 13:32	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/06/15 12:09	02/09/15 13:32	1
Diethyl phthalate	**0.16**	**J B**	0.94	0.14	ug/L		02/06/15 12:09	02/09/15 13:32	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/06/15 12:09	02/09/15 13:32	1
Di-n-octyl phthalate	**0.64**	**J**	0.94	0.19	ug/L		02/06/15 12:09	02/09/15 13:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*67*		*38 - 106*	*02/06/15 12:09*	*02/09/15 13:32*	*1*
2-Fluorobiphenyl	*63*		*39 - 100*	*02/06/15 12:09*	*02/09/15 13:32*	*1*
2-Fluorophenol (Surr)	*50*		*18 - 109*	*02/06/15 12:09*	*02/09/15 13:32*	*1*
Nitrobenzene-d5 (Surr)	*61*		*39 - 100*	*02/06/15 12:09*	*02/09/15 13:32*	*1*
Phenol-d5 (Surr)	*50*		*32 - 100*	*02/06/15 12:09*	*02/09/15 13:32*	*1*
Terphenyl-d14	*75*		*35 - 103*	*02/06/15 12:09*	*02/09/15 13:32*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		2.5	0.49	mg/L			02/06/15 16:49	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/09/15 08:42	02/10/15 10:12	1
Iron	**12**	**J**	50	9.5	ug/L		02/09/15 08:42	02/10/15 10:12	1
Nickel	**2.2**	**J**	10	0.51	ug/L		02/09/15 08:42	02/10/15 10:12	1
Zinc	**15**		10	1.0	ug/L		02/09/15 08:42	02/10/15 10:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/09/15 14:40	02/09/15 16:41	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/06/15 13:59	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			02/06/15 11:46	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(38-106)	(39-100)	(18-109)	(39-100)	(32-100)	(35-103)		
180-41077-1	OC-FRAC 2-020515	67	63	50	61	50	75		
LCS 180-132856/2-A	Lab Control Sample	72	68	67	66	68	64		
LCSD 180-132856/3-A	Lab Control Sample Dup	70	65	65	64	66	63		
MB 180-132856/1-A	Method Blank	59	64	65	64	69	64		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-132856/1-A
Matrix: Water
Analysis Batch: 132988

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 132856

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/06/15 09:14	02/09/15 10:51	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/06/15 09:14	02/09/15 10:51	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/06/15 09:14	02/09/15 10:51	1
Diethyl phthalate	0.313	J	1.0	0.15	ug/L		02/06/15 09:14	02/09/15 10:51	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/06/15 09:14	02/09/15 10:51	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/06/15 09:14	02/09/15 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*38 - 106*	*02/06/15 09:14*	*02/09/15 10:51*	*1*
2-Fluorobiphenyl	*64*		*39 - 100*	*02/06/15 09:14*	*02/09/15 10:51*	*1*
2-Fluorophenol (Surr)	*65*		*18 - 109*	*02/06/15 09:14*	*02/09/15 10:51*	*1*
Nitrobenzene-d5 (Surr)	*64*		*39 - 100*	*02/06/15 09:14*	*02/09/15 10:51*	*1*
Phenol-d5 (Surr)	*69*		*32 - 100*	*02/06/15 09:14*	*02/09/15 10:51*	*1*
Terphenyl-d14	*64*		*35 - 103*	*02/06/15 09:14*	*02/09/15 10:51*	*1*

Lab Sample ID: LCS 180-132856/2-A
Matrix: Water
Analysis Batch: 132988

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 132856

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.7		ug/L		73	24 - 129
Butyl benzyl phthalate	20.0	14.3		ug/L		72	38 - 110
Di-n-butyl phthalate	20.0	14.7		ug/L		73	42 - 106
Diethyl phthalate	20.0	14.5		ug/L		73	40 - 106
Dimethyl phthalate	20.0	14.0		ug/L		70	43 - 100
Di-n-octyl phthalate	20.0	14.5		ug/L		73	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*72*		*38 - 106*
2-Fluorobiphenyl	*68*		*39 - 100*
2-Fluorophenol (Surr)	*67*		*18 - 109*
Nitrobenzene-d5 (Surr)	*66*		*39 - 100*
Phenol-d5 (Surr)	*68*		*32 - 100*
Terphenyl-d14	*64*		*35 - 103*

Lab Sample ID: LCSD 180-132856/3-A
Matrix: Water
Analysis Batch: 132988

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 132856

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.4		ug/L		72	24 - 129	2	32
Butyl benzyl phthalate	20.0	14.1		ug/L		70	38 - 110	2	18
Di-n-butyl phthalate	20.0	14.2		ug/L		71	42 - 106	3	18
Diethyl phthalate	20.0	13.9		ug/L		69	40 - 106	5	17
Dimethyl phthalate	20.0	13.6		ug/L		68	43 - 100	3	18
Di-n-octyl phthalate	20.0	14.1		ug/L		71	31 - 111	3	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-132856/3-A
Matrix: Water
Analysis Batch: 132988

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 132856

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*38 - 106*
2-Fluorobiphenyl	*65*		*39 - 100*
2-Fluorophenol (Surr)	*65*		*18 - 109*
Nitrobenzene-d5 (Surr)	*64*		*39 - 100*
Phenol-d5 (Surr)	*66*		*32 - 100*
Terphenyl-d14	*63*		*35 - 103*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-132834/6
Matrix: Water
Analysis Batch: 132834

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			02/06/15 09:00	1

Lab Sample ID: LCS 180-132834/5
Matrix: Water
Analysis Batch: 132834

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.2		mg/L		102	90 - 110

Lab Sample ID: 180-41077-1 MS
Matrix: Water
Analysis Batch: 132834

Client Sample ID: OC-FRAC 2-020515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	160		62.5	234		mg/L		114	80 - 120

Lab Sample ID: 180-41077-1 MSD
Matrix: Water
Analysis Batch: 132834

Client Sample ID: OC-FRAC 2-020515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	160		62.5	234		mg/L		114	80 - 120	0	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-132977/1-A
Matrix: Water
Analysis Batch: 133196

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 132977

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/09/15 08:42	02/10/15 09:57	1
Iron	ND		50	9.5	ug/L		02/09/15 08:42	02/10/15 09:57	1
Nickel	ND		10	0.51	ug/L		02/09/15 08:42	02/10/15 09:57	1
Zinc	ND		10	1.0	ug/L		02/09/15 08:42	02/10/15 09:57	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-132977/2-A
Matrix: Water
Analysis Batch: 133196

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 132977

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	515		ug/L		103	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	485		ug/L		97	85 - 115
Zinc	500	495		ug/L		99	85 - 115

Lab Sample ID: LCSD 180-132977/3-A
Matrix: Water
Analysis Batch: 133196

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 132977

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	521		ug/L		104	85 - 115	1	20
Iron	1000	984		ug/L		98	85 - 115	4	20
Nickel	500	487		ug/L		97	85 - 115	0	20
Zinc	500	498		ug/L		100	85 - 115	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-275218/1-A
Matrix: Water
Analysis Batch: 275284

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 275218

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		02/09/15 14:40	02/09/15 16:39	1

Lab Sample ID: LCS 500-275218/2-A
Matrix: Water
Analysis Batch: 275284

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 275218

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.104		mg/L		104	90 - 110

Lab Sample ID: 180-41077-1 MS
Matrix: Water
Analysis Batch: 275284

Client Sample ID: OC-FRAC 2-020515
Prep Type: Total/NA
Prep Batch: 275218

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.101		mg/L		101	75 - 125

Lab Sample ID: 180-41077-1 MSD
Matrix: Water
Analysis Batch: 275284

Client Sample ID: OC-FRAC 2-020515
Prep Type: Total/NA
Prep Batch: 275218

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0966		mg/L		97	75 - 125	5	20

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-275017/1
Matrix: Water
Analysis Batch: 275017

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/06/15 13:55	1

Lab Sample ID: LCS 500-275017/2
Matrix: Water
Analysis Batch: 275017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	182		mg/L		91	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-274987/1
Matrix: Water
Analysis Batch: 274987

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/06/15 11:45	1

Lab Sample ID: 180-41077-1 DU
Matrix: Water
Analysis Batch: 274987

Client Sample ID: OC-FRAC 2-020515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 132856

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	3520C	
LCS 180-132856/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-132856/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-132856/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 132988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	8270C LL	132856
LCS 180-132856/2-A	Lab Control Sample	Total/NA	Water	8270C LL	132856
LCSD 180-132856/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	132856
MB 180-132856/1-A	Method Blank	Total/NA	Water	8270C LL	132856

HPLC/IC

Analysis Batch: 132834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	300.0	
180-41077-1 MS	OC-FRAC 2-020515	Total/NA	Water	300.0	
180-41077-1 MSD	OC-FRAC 2-020515	Total/NA	Water	300.0	
LCS 180-132834/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-132834/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 132977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total Recoverable	Water	200.7	
LCS 180-132977/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-132977/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-132977/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 133196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total Recoverable	Water	200.7 Rev 4.4	132977
LCS 180-132977/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	132977
LCSD 180-132977/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	132977
MB 180-132977/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	132977

General Chemistry

Analysis Batch: 274987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	SM 4500 Cl F	
180-41077-1 DU	OC-FRAC 2-020515	Total/NA	Water	SM 4500 Cl F	
MB 500-274987/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 275017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	SM 2540D	
LCS 500-275017/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 275017 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-275017/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 275218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	Distill/Phenol	
180-41077-1 MS	OC-FRAC 2-020515	Total/NA	Water	Distill/Phenol	
180-41077-1 MSD	OC-FRAC 2-020515	Total/NA	Water	Distill/Phenol	
LCS 500-275218/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-275218/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 275284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41077-1	OC-FRAC 2-020515	Total/NA	Water	420.4	275218
180-41077-1 MS	OC-FRAC 2-020515	Total/NA	Water	420.4	275218
180-41077-1 MSD	OC-FRAC 2-020515	Total/NA	Water	420.4	275218
LCS 500-275218/2-A	Lab Control Sample	Total/NA	Water	420.4	275218
MB 500-275218/1-A	Method Blank	Total/NA	Water	420.4	275218

Client Sample ID: OC-FRAC 2-020515 — **Lab Sample ID: 180-41077-1**

Date Collected: 02/05/15 09:45 — **Matrix: Water**

Date Received: 02/06/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	132856	02/06/15 12:09	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	132988	02/09/15 13:32	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		2.5	1 mL		132834	02/06/15 16:49	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	132977	02/09/15 08:42	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	133196	02/10/15 10:12	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	275218	02/09/15 14:40	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	275284	02/09/15 16:41	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	275017		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 02/06/15 13:59		
								(End) 02/06/15 14:02		
Total/NA	Analysis	SM 4500 Cl F		1			274987	02/06/15 11:46	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-12-00038	02-06-15 *
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41077-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41077-1	OC-FRAC 2-020515	Water	02/05/15 09:45	02/06/15 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			K - EDTA L - EDA W - pH 4-5 Z - other (specify) Other:
Site:	SSOW#:			

180-41077 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC2 020515	2-5-15	0945	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	2-5-15			2-5-15 1130	
2		2-5-15 1700			2-6-15 9:30	
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41077-1

Login Number: 41077

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41077-1

Login Number: 41077

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41263-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/19/2015 11:27:06 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Job ID: 180-41263-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/13/2015 9:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.8º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 133518. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Client Sample ID: OC-FRAC 6-021215

Lab Sample ID: 180-41263-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	1.1		0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	160	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.0	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	3.5	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	13	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Client Sample ID: OC-FRAC 6-021215
Date Collected: 02/12/15 10:00
Date Received: 02/13/15 09:45

Lab Sample ID: 180-41263-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		02/13/15 13:25	02/17/15 12:53	1
Butyl benzyl phthalate	**1.1**		0.94	0.13	ug/L		02/13/15 13:25	02/17/15 12:53	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/13/15 13:25	02/17/15 12:53	1
Diethyl phthalate	ND		0.94	0.14	ug/L		02/13/15 13:25	02/17/15 12:53	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/13/15 13:25	02/17/15 12:53	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		02/13/15 13:25	02/17/15 12:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*28 - 107*	*02/13/15 13:25*	*02/17/15 12:53*	*1*
2-Fluorobiphenyl	*58*		*31 - 100*	*02/13/15 13:25*	*02/17/15 12:53*	*1*
2-Fluorophenol (Surr)	*54*		*20 - 100*	*02/13/15 13:25*	*02/17/15 12:53*	*1*
Nitrobenzene-d5 (Surr)	*59*		*33 - 100*	*02/13/15 13:25*	*02/17/15 12:53*	*1*
Phenol-d5 (Surr)	*63*		*26 - 100*	*02/13/15 13:25*	*02/17/15 12:53*	*1*
Terphenyl-d14	*67*		*20 - 109*	*02/13/15 13:25*	*02/17/15 12:53*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**	**B**	5.0	0.98	mg/L			02/14/15 22:26	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.0**	**J**	10	3.0	ug/L		02/17/15 08:53	02/18/15 19:38	1
Iron	ND		100	9.5	ug/L		02/17/15 08:53	02/18/15 19:38	1
Nickel	**3.5**	**J**	40	0.51	ug/L		02/17/15 08:53	02/18/15 19:38	1
Zinc	**13**	**J**	20	1.0	ug/L		02/17/15 08:53	02/18/15 19:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/17/15 14:55	02/17/15 16:14	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/13/15 15:06	1
Chlorine, Total Residual	ND	HF	0.80	0.80	mg/L			02/13/15 16:31	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41263-1	OC-FRAC 6-021215	61	58	54	59	63	67		
LCS 180-133518/2-A	Lab Control Sample	60	58	62	58	64	54		
LCSD 180-133518/3-A	Lab Control Sample Dup	63	59	63	59	66	57		
MB 180-133518/1-A	Method Blank	61	59	64	60	69	61		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-133518/1-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/13/15 13:25	02/17/15 11:31	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/13/15 13:25	02/17/15 11:31	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/13/15 13:25	02/17/15 11:31	1
Diethyl phthalate	ND		1.0	0.15	ug/L		02/13/15 13:25	02/17/15 11:31	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/13/15 13:25	02/17/15 11:31	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/13/15 13:25	02/17/15 11:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*28 - 107*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
2-Fluorobiphenyl	*59*		*31 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
2-Fluorophenol (Surr)	*64*		*20 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Nitrobenzene-d5 (Surr)	*60*		*33 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Phenol-d5 (Surr)	*69*		*26 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Terphenyl-d14	*61*		*20 - 109*	*02/13/15 13:25*	*02/17/15 11:31*	*1*

Lab Sample ID: LCS 180-133518/2-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133518

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	12.0		ug/L		60	24 - 129
Butyl benzyl phthalate	20.0	11.6		ug/L		58	38 - 110
Di-n-butyl phthalate	20.0	11.5		ug/L		58	42 - 106
Diethyl phthalate	20.0	11.4		ug/L		57	40 - 106
Dimethyl phthalate	20.0	11.7		ug/L		58	43 - 100
Di-n-octyl phthalate	20.0	12.9		ug/L		64	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*60*		*28 - 107*
2-Fluorobiphenyl	*58*		*31 - 100*
2-Fluorophenol (Surr)	*62*		*20 - 100*
Nitrobenzene-d5 (Surr)	*58*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*54*		*20 - 109*

Lab Sample ID: LCSD 180-133518/3-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133518

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	12.7		ug/L		63	24 - 129	5	32
Butyl benzyl phthalate	20.0	12.4		ug/L		62	38 - 110	7	18
Di-n-butyl phthalate	20.0	11.8		ug/L		59	42 - 106	3	18
Diethyl phthalate	20.0	11.5		ug/L		58	40 - 106	1	17
Dimethyl phthalate	20.0	11.6		ug/L		58	43 - 100	1	18
Di-n-octyl phthalate	20.0	13.2		ug/L		66	31 - 111	2	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-133518/3-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133518

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*63*		*28 - 107*
2-Fluorobiphenyl	*59*		*31 - 100*
2-Fluorophenol (Surr)	*63*		*20 - 100*
Nitrobenzene-d5 (Surr)	*59*		*33 - 100*
Phenol-d5 (Surr)	*66*		*26 - 100*
Terphenyl-d14	*57*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-133537/14
Matrix: Water
Analysis Batch: 133537

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.269	J	1.0	0.20	mg/L			02/14/15 14:35	1

Lab Sample ID: LCS 180-133537/5
Matrix: Water
Analysis Batch: 133537

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.4		mg/L		99	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-133602/1-A
Matrix: Water
Analysis Batch: 133788

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/17/15 08:53	02/18/15 19:28	1
Iron	ND		100	9.5	ug/L		02/17/15 08:53	02/18/15 19:28	1
Nickel	ND		40	0.51	ug/L		02/17/15 08:53	02/18/15 19:28	1
Zinc	ND		20	1.0	ug/L		02/17/15 08:53	02/18/15 19:28	1

Lab Sample ID: LCS 180-133602/2-A
Matrix: Water
Analysis Batch: 133788

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	503		ug/L		101	85 - 115
Iron	1000	942		ug/L		94	85 - 115
Nickel	500	485		ug/L		97	85 - 115
Zinc	500	485		ug/L		97	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-41263-1 MS
Matrix: Water
Analysis Batch: 133788

Client Sample ID: OC-FRAC 6-021215
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	3.0	J	500	511		ug/L		102	70 - 130
Iron	ND		1000	965		ug/L		96	70 - 130
Nickel	3.5	J	500	495		ug/L		98	70 - 130
Zinc	13	J	500	495		ug/L		96	70 - 130

Lab Sample ID: 180-41263-1 MSD
Matrix: Water
Analysis Batch: 133788

Client Sample ID: OC-FRAC 6-021215
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	3.0	J	500	528		ug/L		105	70 - 130	3	20
Iron	ND		1000	980		ug/L		98	70 - 130	2	20
Nickel	3.5	J	500	510		ug/L		101	70 - 130	3	20
Zinc	13	J	500	510		ug/L		99	70 - 130	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-276106/1-A
Matrix: Water
Analysis Batch: 276126

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 276106

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/17/15 14:55	02/17/15 16:06	1

Lab Sample ID: LCS 500-276106/2-A
Matrix: Water
Analysis Batch: 276126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 276106

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0964		mg/L		96	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-275894/1
Matrix: Water
Analysis Batch: 275894

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/13/15 14:50	1

Lab Sample ID: LCS 500-275894/2
Matrix: Water
Analysis Batch: 275894

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	186		mg/L		93	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-275907/1
Matrix: Water
Analysis Batch: 275907

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.80	0.80	mg/L			02/13/15 16:30	1

Lab Sample ID: 180-41263-1 DU
Matrix: Water
Analysis Batch: 275907

Client Sample ID: OC-FRAC 6-021215
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 133518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	3520C	
LCS 180-133518/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-133518/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-133518/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 133593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	8270C LL	133518
LCS 180-133518/2-A	Lab Control Sample	Total/NA	Water	8270C LL	133518
LCSD 180-133518/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	133518
MB 180-133518/1-A	Method Blank	Total/NA	Water	8270C LL	133518

HPLC/IC

Analysis Batch: 133537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	300.0	
LCS 180-133537/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-133537/14	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 133602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total Recoverable	Water	200.7	
180-41263-1 MS	OC-FRAC 6-021215	Total Recoverable	Water	200.7	
180-41263-1 MSD	OC-FRAC 6-021215	Total Recoverable	Water	200.7	
LCS 180-133602/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-133602/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 133788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total Recoverable	Water	200.7 Rev 4.4	133602
180-41263-1 MS	OC-FRAC 6-021215	Total Recoverable	Water	200.7 Rev 4.4	133602
180-41263-1 MSD	OC-FRAC 6-021215	Total Recoverable	Water	200.7 Rev 4.4	133602
LCS 180-133602/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	133602
MB 180-133602/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	133602

General Chemistry

Analysis Batch: 275894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	SM 2540D	
LCS 500-275894/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-275894/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 275907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	SM 4500 Cl F	
180-41263-1 DU	OC-FRAC 6-021215	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 275907 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-275907/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 276106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	Distill/Phenol	
LCS 500-276106/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-276106/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 276126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41263-1	OC-FRAC 6-021215	Total/NA	Water	420.4	276106
LCS 500-276106/2-A	Lab Control Sample	Total/NA	Water	420.4	276106
MB 500-276106/1-A	Method Blank	Total/NA	Water	420.4	276106

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Client Sample ID: OC-FRAC 6-021215 — **Lab Sample ID: 180-41263-1**
Date Collected: 02/12/15 10:00 — **Matrix: Water**
Date Received: 02/13/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	133518	02/13/15 13:25	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	133593	02/17/15 12:53	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL	1.0 mL	133537	02/14/15 22:26	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	133602	02/17/15 08:53	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	133788	02/18/15 19:38	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	276106	02/17/15 14:55	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	276126	02/17/15 16:14	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	275894		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	02/13/15 15:06		
							(End)	02/13/15 15:09		
Total/NA	Analysis	SM 4500 Cl F		1	25 mL	25 mL	275907	02/13/15 16:31	HMW	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

HMW = Heather Wontor

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

CMR = Carl Reagle

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41263-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41263-1	OC-FRAC 6-021215	Water	02/12/15 10:00	02/13/15 09:45

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

180-41263 Chain of Custody

K - EDTA
L - EDA
W - ph 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	D	S	N	N	X	
FRAC 6- 021215	2-12-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	L Johnson	2-12-15			2-12-15 1120	FP
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		2-12-15 1200		Debbie Watson	2-13-15 9:45	AP
	Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41263-1

Login Number: 41263

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41263-1

Login Number: 41263

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41400-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/25/2015 1:05:40 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-41400-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/20/2015 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.2º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Client Sample ID: OC-FRAC 1- 021815

Lab Sample ID: 180-41400-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.78	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.49	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	160	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.3	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.1	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	13	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 1- 021815
Date Collected: 02/18/15 10:30
Date Received: 02/20/15 10:10

Lab Sample ID: 180-41400-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		02/20/15 13:29	02/24/15 10:16	1
Butyl benzyl phthalate	**0.78**	**J**	0.94	0.13	ug/L		02/20/15 13:29	02/24/15 10:16	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/20/15 13:29	02/24/15 10:16	1
Diethyl phthalate	**0.49**	**J B**	0.94	0.14	ug/L		02/20/15 13:29	02/24/15 10:16	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/20/15 13:29	02/24/15 10:16	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		02/20/15 13:29	02/24/15 10:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*79*		*28 - 107*	*02/20/15 13:29*	*02/24/15 10:16*	*1*
2-Fluorobiphenyl	*71*		*31 - 100*	*02/20/15 13:29*	*02/24/15 10:16*	*1*
2-Fluorophenol (Surr)	*67*		*20 - 100*	*02/20/15 13:29*	*02/24/15 10:16*	*1*
Nitrobenzene-d5 (Surr)	*71*		*33 - 100*	*02/20/15 13:29*	*02/24/15 10:16*	*1*
Phenol-d5 (Surr)	*73*		*26 - 100*	*02/20/15 13:29*	*02/24/15 10:16*	*1*
Terphenyl-d14	*89*		*20 - 109*	*02/20/15 13:29*	*02/24/15 10:16*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**	**B**	5.0	0.98	mg/L			02/20/15 15:13	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.3**	**J**	10	3.0	ug/L		02/23/15 08:10	02/24/15 13:13	1
Iron	ND		100	9.5	ug/L		02/23/15 08:10	02/24/15 13:13	1
Nickel	**1.1**	**J**	40	0.51	ug/L		02/23/15 08:10	02/24/15 13:13	1
Zinc	**13**	**J**	20	1.0	ug/L		02/23/15 08:10	02/24/15 13:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		02/23/15 15:39	02/23/15 16:33	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/23/15 10:52	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			02/20/15 10:56	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41400-1	OC-FRAC 1- 021815	79	71	67	71	73	89		
LCS 180-133928/2-A	Lab Control Sample	79	67	59	64	64	73		
LCSD 180-133928/3-A	Lab Control Sample Dup	67	60	58	61	62	65		
MB 180-133928/1-A	Method Blank	73	71	65	70	71	83		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-133928/1-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133928

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/20/15 13:29	02/24/15 08:01	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/20/15 13:29	02/24/15 08:01	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/20/15 13:29	02/24/15 08:01	1
Diethyl phthalate	0.454	J	1.0	0.15	ug/L		02/20/15 13:29	02/24/15 08:01	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/20/15 13:29	02/24/15 08:01	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/20/15 13:29	02/24/15 08:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*73*		*28 - 107*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
2-Fluorobiphenyl	*71*		*31 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
2-Fluorophenol (Surr)	*65*		*20 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Phenol-d5 (Surr)	*71*		*26 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Terphenyl-d14	*83*		*20 - 109*	*02/20/15 13:29*	*02/24/15 08:01*	*1*

Lab Sample ID: LCS 180-133928/2-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133928

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.7		ug/L		78	24 - 129
Butyl benzyl phthalate	20.0	15.6		ug/L		78	38 - 110
Di-n-butyl phthalate	20.0	15.3		ug/L		76	42 - 106
Diethyl phthalate	20.0	15.5		ug/L		78	40 - 106
Dimethyl phthalate	20.0	15.0		ug/L		75	43 - 100
Di-n-octyl phthalate	20.0	15.8		ug/L		79	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*79*		*28 - 107*
2-Fluorobiphenyl	*67*		*31 - 100*
2-Fluorophenol (Surr)	*59*		*20 - 100*
Nitrobenzene-d5 (Surr)	*64*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*73*		*20 - 109*

Lab Sample ID: LCSD 180-133928/3-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133928

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.6		ug/L		73	24 - 129	7	32
Butyl benzyl phthalate	20.0	14.9		ug/L		75	38 - 110	4	18
Di-n-butyl phthalate	20.0	14.0		ug/L		70	42 - 106	9	18
Diethyl phthalate	20.0	14.6		ug/L		73	40 - 106	6	17
Dimethyl phthalate	20.0	14.0		ug/L		70	43 - 100	7	18
Di-n-octyl phthalate	20.0	15.2		ug/L		76	31 - 111	4	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-133928/3-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133928

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*28 - 107*
2-Fluorobiphenyl	*60*		*31 - 100*
2-Fluorophenol (Surr)	*58*		*20 - 100*
Nitrobenzene-d5 (Surr)	*61*		*33 - 100*
Phenol-d5 (Surr)	*62*		*26 - 100*
Terphenyl-d14	*65*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-133917/6
Matrix: Water
Analysis Batch: 133917

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.276	J	1.0	0.20	mg/L			02/20/15 12:16	1

Lab Sample ID: LCS 180-133917/5
Matrix: Water
Analysis Batch: 133917

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110

Lab Sample ID: 180-41400-1 MS
Matrix: Water
Analysis Batch: 133917

Client Sample ID: OC-FRAC 1- 021815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	160	B	125	290		mg/L		106	80 - 120

Lab Sample ID: 180-41400-1 MSD
Matrix: Water
Analysis Batch: 133917

Client Sample ID: OC-FRAC 1- 021815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	160	B	125	292		mg/L		108	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-133985/1-A
Matrix: Water
Analysis Batch: 134149

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 133985

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/23/15 08:10	02/24/15 12:58	1
Iron	ND		100	9.5	ug/L		02/23/15 08:10	02/24/15 12:58	1
Nickel	ND		40	0.51	ug/L		02/23/15 08:10	02/24/15 12:58	1
Zinc	ND		20	1.0	ug/L		02/23/15 08:10	02/24/15 12:58	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-133985/2-A
Matrix: Water
Analysis Batch: 134149

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 133985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	985		ug/L		99	85 - 115
Nickel	500	502		ug/L		100	85 - 115
Zinc	500	496		ug/L		99	85 - 115

Lab Sample ID: LCSD 180-133985/3-A
Matrix: Water
Analysis Batch: 134149

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 133985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	519		ug/L		104	85 - 115	0	20
Iron	1000	991		ug/L		99	85 - 115	1	20
Nickel	500	500		ug/L		100	85 - 115	0	20
Zinc	500	496		ug/L		99	85 - 115	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-276850/1-A
Matrix: Water
Analysis Batch: 276857

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 276850

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		02/23/15 15:39	02/23/15 16:24	1

Lab Sample ID: LCS 500-276850/2-A
Matrix: Water
Analysis Batch: 276857

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 276850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0933		mg/L		93	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-276801/1
Matrix: Water
Analysis Batch: 276801

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/23/15 10:45	1

Lab Sample ID: LCS 500-276801/2
Matrix: Water
Analysis Batch: 276801

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	207		mg/L		103	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-276622/1
Matrix: Water
Analysis Batch: 276622

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/20/15 10:55	1

Lab Sample ID: 180-41400-1 DU
Matrix: Water
Analysis Batch: 276622

Client Sample ID: OC-FRAC 1- 021815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND	HF		ND		mg/L				NC	20

GC/MS Semi VOA

Prep Batch: 133928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	3520C	
LCS 180-133928/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-133928/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-133928/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 134038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	8270C LL	133928
LCS 180-133928/2-A	Lab Control Sample	Total/NA	Water	8270C LL	133928
LCSD 180-133928/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	133928
MB 180-133928/1-A	Method Blank	Total/NA	Water	8270C LL	133928

HPLC/IC

Analysis Batch: 133917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	300.0	
180-41400-1 MS	OC-FRAC 1- 021815	Total/NA	Water	300.0	
180-41400-1 MSD	OC-FRAC 1- 021815	Total/NA	Water	300.0	
LCS 180-133917/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-133917/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 133985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total Recoverable	Water	200.7	
LCS 180-133985/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-133985/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-133985/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 134149

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total Recoverable	Water	200.7 Rev 4.4	133985
LCS 180-133985/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	133985
LCSD 180-133985/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	133985
MB 180-133985/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	133985

General Chemistry

Analysis Batch: 276622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	SM 4500 Cl F	
180-41400-1 DU	OC-FRAC 1- 021815	Total/NA	Water	SM 4500 Cl F	
MB 500-276622/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 276801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	SM 2540D	
LCS 500-276801/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 276801 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-276801/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 276850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	Distill/Phenol	
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-276850/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 276857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41400-1	OC-FRAC 1- 021815	Total/NA	Water	420.4	276850
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	420.4	276850
MB 500-276850/1-A	Method Blank	Total/NA	Water	420.4	276850

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Client Sample ID: OC-FRAC 1- 021815
Date Collected: 02/18/15 10:30
Date Received: 02/20/15 10:10

Lab Sample ID: 180-41400-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	133928	02/20/15 13:29	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	134038	02/24/15 10:16	FBB	TAL PIT
		Instrument ID: CH71								
Total/NA	Analysis	300.0		5	1 mL		133917	02/20/15 15:13	CMR	TAL PIT
		Instrument ID: CHIC2100A								
Total Recoverable	Prep	200.7			50 mL	50 mL	133985	02/23/15 08:10	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	134149	02/24/15 13:13	RJG	TAL PIT
		Instrument ID: C								
Total/NA	Prep	Distill/Phenol			100 mL	103 mL	276850	02/23/15 15:39	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	103 mL	276857	02/23/15 16:33	AJR	TAL CHI
		Instrument ID: SEAL2								
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	276801		SMO	TAL CHI
		Instrument ID: NOEQUIP						(Start) 02/23/15 10:52		
								(End) 02/23/15 10:53		
Total/NA	Analysis	SM 4500 Cl F		1			276622	02/20/15 10:56	MTB	TAL CHI
		Instrument ID: NOEQUIP								

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

CMR = Carl Reagle

FBB = Frank Bungard

RJG = Rob Good

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41400-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41400-1	OC-FRAC 1- 021815	Water	02/18/15 10:30	02/20/15 10:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

BNA 3
7EE
PP
mt
SBB

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes: A - HCL M - Hexane
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			rate
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			L - EDA
Site:	SSOW#:			Other:

180-41400 Chain of Custody

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_CL_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containe	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 1- 021815	2-18-15	1030	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	2-19-15		[signature]	2-19-15 1300	TA
[signature]	2-19-15 1700	TA	Debbie Watson	2-20-15	TAP
				10:10	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41400-1

Login Number: 41400

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41400-1

Login Number: 41400

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41401-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/25/2015 1:07:21 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-41401-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/20/2015 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 1.2º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Client Sample ID: OC-INF- 021915

Lab Sample ID: 180-41401-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	5.2		1.9	1.2	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.36	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	140	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	6.1	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	2500		100	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.71	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	23		20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Total Suspended Solids	3.0	J	5.0	1.6	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Client Sample ID: OC-INF- 021915
Date Collected: 02/19/15 08:30
Date Received: 02/20/15 10:10

Lab Sample ID: 180-41401-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**5.2**		1.9	1.2	ug/L		02/20/15 13:29	02/24/15 10:43	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		02/20/15 13:29	02/24/15 10:43	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/20/15 13:29	02/24/15 10:43	1
Diethyl phthalate	**0.36**	**J B**	0.94	0.14	ug/L		02/20/15 13:29	02/24/15 10:43	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/20/15 13:29	02/24/15 10:43	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		02/20/15 13:29	02/24/15 10:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*74*		*28 - 107*	*02/20/15 13:29*	*02/24/15 10:43*	*1*
2-Fluorobiphenyl	*64*		*31 - 100*	*02/20/15 13:29*	*02/24/15 10:43*	*1*
2-Fluorophenol (Surr)	*64*		*20 - 100*	*02/20/15 13:29*	*02/24/15 10:43*	*1*
Nitrobenzene-d5 (Surr)	*67*		*33 - 100*	*02/20/15 13:29*	*02/24/15 10:43*	*1*
Phenol-d5 (Surr)	*63*		*26 - 100*	*02/20/15 13:29*	*02/24/15 10:43*	*1*
Terphenyl-d14	*55*		*20 - 109*	*02/20/15 13:29*	*02/24/15 10:43*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**	**B**	5.0	0.98	mg/L			02/20/15 15:59	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**6.1**	**J**	10	3.0	ug/L		02/23/15 08:10	02/24/15 13:23	1
Iron	**2500**		100	9.5	ug/L		02/23/15 08:10	02/24/15 13:23	1
Nickel	**0.71**	**J**	40	0.51	ug/L		02/23/15 08:10	02/24/15 13:23	1
Zinc	**23**		20	1.0	ug/L		02/23/15 08:10	02/24/15 13:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		02/23/15 15:39	02/23/15 16:32	1
Total Suspended Solids	**3.0**	**J**	5.0	1.6	mg/L			02/23/15 10:53	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			02/20/15 10:58	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41401-1	OC-INF- 021915	74	64	64	67	63	55		
LCS 180-133928/2-A	Lab Control Sample	79	67	59	64	64	73		
LCSD 180-133928/3-A	Lab Control Sample Dup	67	60	58	61	62	65		
MB 180-133928/1-A	Method Blank	73	71	65	70	71	83		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-133928/1-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133928

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/20/15 13:29	02/24/15 08:01	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/20/15 13:29	02/24/15 08:01	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/20/15 13:29	02/24/15 08:01	1
Diethyl phthalate	0.454	J	1.0	0.15	ug/L		02/20/15 13:29	02/24/15 08:01	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/20/15 13:29	02/24/15 08:01	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/20/15 13:29	02/24/15 08:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*73*		*28 - 107*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
2-Fluorobiphenyl	*71*		*31 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
2-Fluorophenol (Surr)	*65*		*20 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Phenol-d5 (Surr)	*71*		*26 - 100*	*02/20/15 13:29*	*02/24/15 08:01*	*1*
Terphenyl-d14	*83*		*20 - 109*	*02/20/15 13:29*	*02/24/15 08:01*	*1*

Lab Sample ID: LCS 180-133928/2-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133928

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.7		ug/L		78	24 - 129
Butyl benzyl phthalate	20.0	15.6		ug/L		78	38 - 110
Di-n-butyl phthalate	20.0	15.3		ug/L		76	42 - 106
Diethyl phthalate	20.0	15.5		ug/L		78	40 - 106
Dimethyl phthalate	20.0	15.0		ug/L		75	43 - 100
Di-n-octyl phthalate	20.0	15.8		ug/L		79	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*79*		*28 - 107*
2-Fluorobiphenyl	*67*		*31 - 100*
2-Fluorophenol (Surr)	*59*		*20 - 100*
Nitrobenzene-d5 (Surr)	*64*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*73*		*20 - 109*

Lab Sample ID: LCSD 180-133928/3-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133928

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.6		ug/L		73	24 - 129	7	32
Butyl benzyl phthalate	20.0	14.9		ug/L		75	38 - 110	4	18
Di-n-butyl phthalate	20.0	14.0		ug/L		70	42 - 106	9	18
Diethyl phthalate	20.0	14.6		ug/L		73	40 - 106	6	17
Dimethyl phthalate	20.0	14.0		ug/L		70	43 - 100	7	18
Di-n-octyl phthalate	20.0	15.2		ug/L		76	31 - 111	4	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-133928/3-A
Matrix: Water
Analysis Batch: 134038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133928

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*28 - 107*
2-Fluorobiphenyl	*60*		*31 - 100*
2-Fluorophenol (Surr)	*58*		*20 - 100*
Nitrobenzene-d5 (Surr)	*61*		*33 - 100*
Phenol-d5 (Surr)	*62*		*26 - 100*
Terphenyl-d14	*65*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-133917/6
Matrix: Water
Analysis Batch: 133917

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.276	J	1.0	0.20	mg/L			02/20/15 12:16	1

Lab Sample ID: LCS 180-133917/5
Matrix: Water
Analysis Batch: 133917

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-133985/1-A
Matrix: Water
Analysis Batch: 134149

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 133985

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/23/15 08:10	02/24/15 12:58	1
Iron	ND		100	9.5	ug/L		02/23/15 08:10	02/24/15 12:58	1
Nickel	ND		40	0.51	ug/L		02/23/15 08:10	02/24/15 12:58	1
Zinc	ND		20	1.0	ug/L		02/23/15 08:10	02/24/15 12:58	1

Lab Sample ID: LCS 180-133985/2-A
Matrix: Water
Analysis Batch: 134149

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 133985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	985		ug/L		99	85 - 115
Nickel	500	502		ug/L		100	85 - 115
Zinc	500	496		ug/L		99	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-133985/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 134149 — **Prep Batch: 133985**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	519		ug/L		104	85 - 115	0	20
Iron	1000	991		ug/L		99	85 - 115	1	20
Nickel	500	500		ug/L		100	85 - 115	0	20
Zinc	500	496		ug/L		99	85 - 115	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-276850/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276857 — **Prep Batch: 276850**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		02/23/15 15:39	02/23/15 16:24	1

Lab Sample ID: LCS 500-276850/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276857 — **Prep Batch: 276850**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0933		mg/L		93	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-276801/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276801

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/23/15 10:45	1

Lab Sample ID: LCS 500-276801/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276801

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	207		mg/L		103	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-276622/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276622

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/20/15 10:55	1

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

GC/MS Semi VOA

Prep Batch: 133928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	3520C	
LCS 180-133928/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-133928/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-133928/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 134038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	8270C LL	133928
LCS 180-133928/2-A	Lab Control Sample	Total/NA	Water	8270C LL	133928
LCSD 180-133928/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	133928
MB 180-133928/1-A	Method Blank	Total/NA	Water	8270C LL	133928

HPLC/IC

Analysis Batch: 133917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	300.0	
LCS 180-133917/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-133917/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 133985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total Recoverable	Water	200.7	
LCS 180-133985/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-133985/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-133985/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 134149

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total Recoverable	Water	200.7 Rev 4.4	133985
LCS 180-133985/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	133985
LCSD 180-133985/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	133985
MB 180-133985/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	133985

General Chemistry

Analysis Batch: 276622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	SM 4500 Cl F	
MB 500-276622/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 276801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	SM 2540D	
LCS 500-276801/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-276801/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 276850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	Distill/Phenol	
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-276850/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 276857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41401-1	OC-INF- 021915	Total/NA	Water	420.4	276850
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	420.4	276850
MB 500-276850/1-A	Method Blank	Total/NA	Water	420.4	276850

Client Sample ID: OC-INF- 021915 — **Lab Sample ID: 180-41401-1**

Date Collected: 02/19/15 08:30 — **Matrix: Water**

Date Received: 02/20/15 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	133928	02/20/15 13:29	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	134038	02/24/15 10:43	FBB	TAL PIT
	Instrument ID: CH71									
Total/NA	Analysis	300.0		5	1 mL		133917	02/20/15 15:59	CMR	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	133985	02/23/15 08:10	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	134149	02/24/15 13:23	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	104 mL	276850	02/23/15 15:39	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	104 mL	276857	02/23/15 16:32	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	276801		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	02/23/15 10:53		
							(End)	02/23/15 10:55		
Total/NA	Analysis	SM 4500 Cl F		1			276622	02/20/15 10:58	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

CMR = Carl Reagle

FBB = Frank Bungard

RJG = Rob Good

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41401-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41401-1	OC-INF- 021915	Water	02/19/15 08:30	02/20/15 10:10

BN A3
7 EE
7 AP
mt
5 BB

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

180-41401 Chain of Custody

Analysis Request

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
INF 021915	2-19-15	0830	G	Water			X		X	X	X	X	X		
				Water											

Other:

I - Ice
J - DI Water
K - EDTA
L - EDA
V - MCAA
W - ph 4-5
Z - other (specify)

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	2-19-15		[signature]	2-19-15 1300	TA
[signature]	2-19-15 - 1300	TA	Dellie Watson	2-20-15	TAP
				10:10	

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41401-1

Login Number: 41401

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41401-1

Login Number: 41401

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41416-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/26/2015 1:26:32 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Job ID: 180-41416-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/21/2015 10:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch # 133978.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Client Sample ID: OC-FRAC4 022015

Lab Sample ID: 180-41416-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.75	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.26	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	150	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	3.5	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.78	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	9.5	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Client Sample ID: OC-FRAC4 022015
Date Collected: 02/20/15 10:00
Date Received: 02/21/15 10:45

Lab Sample ID: 180-41416-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		02/23/15 07:11	02/25/15 05:49	1
Butyl benzyl phthalate	**0.75**	**J**	0.94	0.13	ug/L		02/23/15 07:11	02/25/15 05:49	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/23/15 07:11	02/25/15 05:49	1
Diethyl phthalate	**0.26**	**J B**	0.94	0.14	ug/L		02/23/15 07:11	02/25/15 05:49	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/23/15 07:11	02/25/15 05:49	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		02/23/15 07:11	02/25/15 05:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*50*		*28 - 107*	*02/23/15 07:11*	*02/25/15 05:49*	*1*
2-Fluorobiphenyl	*62*		*31 - 100*	*02/23/15 07:11*	*02/25/15 05:49*	*1*
2-Fluorophenol (Surr)	*70*		*20 - 100*	*02/23/15 07:11*	*02/25/15 05:49*	*1*
Nitrobenzene-d5 (Surr)	*65*		*33 - 100*	*02/23/15 07:11*	*02/25/15 05:49*	*1*
Phenol-d5 (Surr)	*71*		*26 - 100*	*02/23/15 07:11*	*02/25/15 05:49*	*1*
Terphenyl-d14	*63*		*20 - 109*	*02/23/15 07:11*	*02/25/15 05:49*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**	**B**	5.0	0.98	mg/L			02/21/15 16:29	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.5**	**J**	10	3.0	ug/L		02/24/15 07:03	02/25/15 09:57	1
Iron	ND		100	9.5	ug/L		02/24/15 07:03	02/25/15 09:57	1
Nickel	**0.78**	**J**	40	0.51	ug/L		02/24/15 07:03	02/25/15 09:57	1
Zinc	**9.5**	**J**	20	1.0	ug/L		02/24/15 07:03	02/25/15 09:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/23/15 15:39	02/23/15 16:37	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/23/15 10:55	1
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/21/15 11:16	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41416-1	OC-FRAC4 022015	50	62	70	65	71	63		
LCS 180-133978/2-A	Lab Control Sample	57	63	66	65	65	66		
LCSD 180-133978/3-A	Lab Control Sample Dup	56	64	70	65	67	65		
MB 180-133978/1-A	Method Blank	59	71	78	73	78	74		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-133978/1-A
Matrix: Water
Analysis Batch: 134139

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133978

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/23/15 07:11	02/25/15 02:09	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/23/15 07:11	02/25/15 02:09	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/23/15 07:11	02/25/15 02:09	1
Diethyl phthalate	0.405	J	1.0	0.15	ug/L		02/23/15 07:11	02/25/15 02:09	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/23/15 07:11	02/25/15 02:09	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/23/15 07:11	02/25/15 02:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*28 - 107*	*02/23/15 07:11*	*02/25/15 02:09*	*1*
2-Fluorobiphenyl	*71*		*31 - 100*	*02/23/15 07:11*	*02/25/15 02:09*	*1*
2-Fluorophenol (Surr)	*78*		*20 - 100*	*02/23/15 07:11*	*02/25/15 02:09*	*1*
Nitrobenzene-d5 (Surr)	*73*		*33 - 100*	*02/23/15 07:11*	*02/25/15 02:09*	*1*
Phenol-d5 (Surr)	*78*		*26 - 100*	*02/23/15 07:11*	*02/25/15 02:09*	*1*
Terphenyl-d14	*74*		*20 - 109*	*02/23/15 07:11*	*02/25/15 02:09*	*1*

Lab Sample ID: LCS 180-133978/2-A
Matrix: Water
Analysis Batch: 134139

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133978

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	18.7		ug/L		93	24 - 129
Butyl benzyl phthalate	20.0	18.2		ug/L		91	38 - 110
Di-n-butyl phthalate	20.0	17.4		ug/L		87	42 - 106
Diethyl phthalate	20.0	15.8		ug/L		79	40 - 106
Dimethyl phthalate	20.0	14.9		ug/L		75	43 - 100
Di-n-octyl phthalate	20.0	14.8		ug/L		74	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*57*		*28 - 107*
2-Fluorobiphenyl	*63*		*31 - 100*
2-Fluorophenol (Surr)	*66*		*20 - 100*
Nitrobenzene-d5 (Surr)	*65*		*33 - 100*
Phenol-d5 (Surr)	*65*		*26 - 100*
Terphenyl-d14	*66*		*20 - 109*

Lab Sample ID: LCSD 180-133978/3-A
Matrix: Water
Analysis Batch: 134139

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133978

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.0		ug/L		85	24 - 129	10	32
Butyl benzyl phthalate	20.0	16.4		ug/L		82	38 - 110	11	18
Di-n-butyl phthalate	20.0	15.3		ug/L		77	42 - 106	12	18
Diethyl phthalate	20.0	14.7		ug/L		74	40 - 106	7	17
Dimethyl phthalate	20.0	13.8		ug/L		69	43 - 100	8	18
Di-n-octyl phthalate	20.0	13.6		ug/L		68	31 - 111	8	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-133978/3-A
Matrix: Water
Analysis Batch: 134139

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133978

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*56*		*28 - 107*
2-Fluorobiphenyl	*64*		*31 - 100*
2-Fluorophenol (Surr)	*70*		*20 - 100*
Nitrobenzene-d5 (Surr)	*65*		*33 - 100*
Phenol-d5 (Surr)	*67*		*26 - 100*
Terphenyl-d14	*65*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-133942/6
Matrix: Water
Analysis Batch: 133942

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.283	J	1.0	0.20	mg/L			02/21/15 09:37	1

Lab Sample ID: LCS 180-133942/5
Matrix: Water
Analysis Batch: 133942

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-134055/1-A
Matrix: Water
Analysis Batch: 134265

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 134055

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/24/15 07:03	02/25/15 09:42	1
Iron	ND		100	9.5	ug/L		02/24/15 07:03	02/25/15 09:42	1
Nickel	ND		40	0.51	ug/L		02/24/15 07:03	02/25/15 09:42	1
Zinc	ND		20	1.0	ug/L		02/24/15 07:03	02/25/15 09:42	1

Lab Sample ID: LCS 180-134055/2-A
Matrix: Water
Analysis Batch: 134265

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 134055

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	510		ug/L		102	85 - 115
Iron	1000	982		ug/L		98	85 - 115
Nickel	500	490		ug/L		98	85 - 115
Zinc	500	496		ug/L		99	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCSD 180-134055/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 134265 — **Prep Batch: 134055**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	513		ug/L		103	85 - 115	1	20
Iron	1000	998		ug/L		100	85 - 115	2	20
Nickel	500	495		ug/L		99	85 - 115	1	20
Zinc	500	504		ug/L		101	85 - 115	2	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-276850/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276857 — **Prep Batch: 276850**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		02/23/15 15:39	02/23/15 16:24	1

Lab Sample ID: LCS 500-276850/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276857 — **Prep Batch: 276850**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0933		mg/L		93	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-276801/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276801

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/23/15 10:45	1

Lab Sample ID: LCS 500-276801/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276801

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	207		mg/L		103	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-276754/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 276754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/21/15 11:15	1

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Method: SM 4500 Cl F - Chlorine, Residual (Continued)

Lab Sample ID: 180-41416-1 DU
Matrix: Water
Analysis Batch: 276754

Client Sample ID: OC-FRAC4 022015
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	ND			ND		mg/L				NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

GC/MS Semi VOA

Prep Batch: 133978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	3520C	
LCS 180-133978/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-133978/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-133978/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 134139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	8270C LL	133978
LCS 180-133978/2-A	Lab Control Sample	Total/NA	Water	8270C LL	133978
LCSD 180-133978/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	133978
MB 180-133978/1-A	Method Blank	Total/NA	Water	8270C LL	133978

HPLC/IC

Analysis Batch: 133942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	300.0	
LCS 180-133942/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-133942/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 134055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total Recoverable	Water	200.7	
LCS 180-134055/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-134055/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-134055/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 134265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total Recoverable	Water	200.7 Rev 4.4	134055
LCS 180-134055/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	134055
LCSD 180-134055/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	134055
MB 180-134055/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	134055

General Chemistry

Analysis Batch: 276754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	SM 4500 Cl F	
180-41416-1 DU	OC-FRAC4 022015	Total/NA	Water	SM 4500 Cl F	
MB 500-276754/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 276801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	SM 2540D	
LCS 500-276801/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-276801/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 276850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	Distill/Phenol	
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-276850/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 276857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41416-1	OC-FRAC4 022015	Total/NA	Water	420.4	276850
LCS 500-276850/2-A	Lab Control Sample	Total/NA	Water	420.4	276850
MB 500-276850/1-A	Method Blank	Total/NA	Water	420.4	276850

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Client Sample ID: OC-FRAC4 022015
Date Collected: 02/20/15 10:00
Date Received: 02/21/15 10:45

Lab Sample ID: 180-41416-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	133978	02/23/15 07:11	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	134139	02/25/15 05:49	FBB	TAL PIT
	Instrument ID: CH722									
Total/NA	Analysis	300.0		5	1 mL		133942	02/21/15 16:29	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	134055	02/24/15 07:03	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	134265	02/25/15 09:57	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	276850	02/23/15 15:39	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	276857	02/23/15 16:37	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	276801		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	02/23/15 10:55		
							(End)	02/23/15 10:56		
Total/NA	Analysis	SM 4500 Cl F		1			276754	02/21/15 11:16	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

FBB = Frank Bungard

MJH = Matthew Hartman

RJG = Rob Good

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41416-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41416-1	OC-FRAC4 022015	Water	02/20/15 10:00	02/21/15 10:45

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	D	S	N	N	X	
FRAC4. 022015	2-20-15	1000	G	Water			X		X	X	X	X	X		
				Water											

200.7
4500 cl F chlorine
8270 WENT TO Pittsburgh THE Rest To Chicago.

180-41416 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by: L Johnson	Date/Time: 2-20-15	Company	Received by:	Date/Time: 2/20/15 15:34	Company FT
Relinquished by:	Date/Time: 2/20/15 15:00	Company TA	Received by:	Date/Time: 2/21/15	Company TA Pitt
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41416-1

Login Number: 41416

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Lonzo, Michael A

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41416-1

Login Number: 41416

List Number: 2

Creator: Lonzo, Michael A

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41513-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/2/2015 12:55:20 PM

Becky Mason, Project Manager II
(413)572-4000
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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 180-41513-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/26/2015 10:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.8º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch # 134330.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Client Sample ID: OC-FRAC 5-022515

Lab Sample ID: 180-41513-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.56	J *	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.33	J *	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	140	B	5.0	0.98	mg/L	5		300.0	Total/NA
Zinc	15	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.0050	J	0.0051	0.0022	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Client Sample ID: OC-FRAC 5-022515
Date Collected: 02/25/15 10:00
Date Received: 02/26/15 10:00

Lab Sample ID: 180-41513-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		02/26/15 12:25	02/27/15 19:00	1
Butyl benzyl phthalate	**0.56**	**J ***	0.94	0.13	ug/L		02/26/15 12:25	02/27/15 19:00	1
Di-n-butyl phthalate	ND	*	0.94	0.12	ug/L		02/26/15 12:25	02/27/15 19:00	1
Diethyl phthalate	**0.33**	**J ***	0.94	0.14	ug/L		02/26/15 12:25	02/27/15 19:00	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/26/15 12:25	02/27/15 19:00	1
Di-n-octyl phthalate	ND	*	0.94	0.19	ug/L		02/26/15 12:25	02/27/15 19:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*80*		*28 - 107*	*02/26/15 12:25*	*02/27/15 19:00*	*1*
2-Fluorobiphenyl	*81*		*31 - 100*	*02/26/15 12:25*	*02/27/15 19:00*	*1*
2-Fluorophenol (Surr)	*71*		*20 - 100*	*02/26/15 12:25*	*02/27/15 19:00*	*1*
Nitrobenzene-d5 (Surr)	*78*		*33 - 100*	*02/26/15 12:25*	*02/27/15 19:00*	*1*
Phenol-d5 (Surr)	*66*		*26 - 100*	*02/26/15 12:25*	*02/27/15 19:00*	*1*
Terphenyl-d14	*84*		*20 - 109*	*02/26/15 12:25*	*02/27/15 19:00*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**	**B**	5.0	0.98	mg/L			02/26/15 23:09	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/27/15 08:45	03/02/15 07:36	1
Iron	ND		100	9.5	ug/L		02/27/15 08:45	03/02/15 07:36	1
Nickel	ND		40	0.51	ug/L		02/27/15 08:45	03/02/15 07:36	1
Zinc	**15**	**J**	20	1.0	ug/L		02/27/15 08:45	03/02/15 07:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0050**	**J**	0.0051	0.0022	mg/L		02/27/15 13:16	02/27/15 14:54	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/26/15 15:49	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			02/26/15 12:26	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41513-1	OC-FRAC 5-022515	80	81	71	78	66	84		
LCS 180-134330/2-A	Lab Control Sample	72	61	51	58	49	66		
LCSD 180-134330/3-A	Lab Control Sample Dup	80	73	60	70	60	77		
MB 180-134330/1-A	Method Blank	72	76	70	70	74	86		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-134330/1-A
Matrix: Water
Analysis Batch: 134379

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 134330

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/26/15 12:25	02/27/15 15:24	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/26/15 12:25	02/27/15 15:24	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/26/15 12:25	02/27/15 15:24	1
Diethyl phthalate	ND		1.0	0.15	ug/L		02/26/15 12:25	02/27/15 15:24	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/26/15 12:25	02/27/15 15:24	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/26/15 12:25	02/27/15 15:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*28 - 107*	*02/26/15 12:25*	*02/27/15 15:24*	*1*
2-Fluorobiphenyl	*76*		*31 - 100*	*02/26/15 12:25*	*02/27/15 15:24*	*1*
2-Fluorophenol (Surr)	*70*		*20 - 100*	*02/26/15 12:25*	*02/27/15 15:24*	*1*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*	*02/26/15 12:25*	*02/27/15 15:24*	*1*
Phenol-d5 (Surr)	*74*		*26 - 100*	*02/26/15 12:25*	*02/27/15 15:24*	*1*
Terphenyl-d14	*86*		*20 - 109*	*02/26/15 12:25*	*02/27/15 15:24*	*1*

Lab Sample ID: LCS 180-134330/2-A
Matrix: Water
Analysis Batch: 134379

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 134330

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.2		ug/L		71	24 - 129
Butyl benzyl phthalate	20.0	14.1		ug/L		71	38 - 110
Di-n-butyl phthalate	20.0	15.5		ug/L		77	42 - 106
Diethyl phthalate	20.0	15.7		ug/L		78	40 - 106
Dimethyl phthalate	20.0	15.4		ug/L		77	43 - 100
Di-n-octyl phthalate	20.0	13.7		ug/L		68	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*72*		*28 - 107*
2-Fluorobiphenyl	*61*		*31 - 100*
2-Fluorophenol (Surr)	*51*		*20 - 100*
Nitrobenzene-d5 (Surr)	*58*		*33 - 100*
Phenol-d5 (Surr)	*49*		*26 - 100*
Terphenyl-d14	*66*		*20 - 109*

Lab Sample ID: LCSD 180-134330/3-A
Matrix: Water
Analysis Batch: 134379

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 134330

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	17.9		ug/L		90	24 - 129	23	32
Butyl benzyl phthalate	20.0	17.4	*	ug/L		87	38 - 110	21	18
Di-n-butyl phthalate	20.0	18.7	*	ug/L		93	42 - 106	19	18
Diethyl phthalate	20.0	19.3	*	ug/L		97	40 - 106	21	17
Dimethyl phthalate	20.0	18.3		ug/L		91	43 - 100	17	18
Di-n-octyl phthalate	20.0	17.7	*	ug/L		89	31 - 111	26	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-134330/3-A
Matrix: Water
Analysis Batch: 134379

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 134330

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*80*		*28 - 107*
2-Fluorobiphenyl	*73*		*31 - 100*
2-Fluorophenol (Surr)	*60*		*20 - 100*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*
Phenol-d5 (Surr)	*60*		*26 - 100*
Terphenyl-d14	*77*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-134309/37
Matrix: Water
Analysis Batch: 134309

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.315	J	1.0	0.20	mg/L			02/26/15 19:20	1

Lab Sample ID: LCS 180-134309/36
Matrix: Water
Analysis Batch: 134309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.7		mg/L		101	90 - 110

Lab Sample ID: 180-41513-1 MS
Matrix: Water
Analysis Batch: 134309

Client Sample ID: OC-FRAC 5-022515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	140	B	125	295		mg/L		120	80 - 120

Lab Sample ID: 180-41513-1 MSD
Matrix: Water
Analysis Batch: 134309

Client Sample ID: OC-FRAC 5-022515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	140	B	125	297	F1	mg/L		121	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-134392/1-A
Matrix: Water
Analysis Batch: 134513

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 134392

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		02/27/15 08:45	03/02/15 07:10	1
Iron	ND		100	9.5	ug/L		02/27/15 08:45	03/02/15 07:10	1
Nickel	ND		40	0.51	ug/L		02/27/15 08:45	03/02/15 07:10	1
Zinc	ND		20	1.0	ug/L		02/27/15 08:45	03/02/15 07:10	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-134392/2-A
Matrix: Water
Analysis Batch: 134513

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 134392

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	528		ug/L		106	85 - 115
Iron	1000	1040		ug/L		104	85 - 115
Nickel	500	483		ug/L		97	85 - 115
Zinc	500	506		ug/L		101	85 - 115

Lab Sample ID: LCSD 180-134392/3-A
Matrix: Water
Analysis Batch: 134513

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 134392

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	532		ug/L		106	85 - 115	1	20
Iron	1000	1030		ug/L		103	85 - 115	1	20
Nickel	500	484		ug/L		97	85 - 115	0	20
Zinc	500	508		ug/L		102	85 - 115	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-277526/1-A
Matrix: Water
Analysis Batch: 277560

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 277526

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0051	0.0022	mg/L		02/27/15 13:16	02/27/15 14:52	1

Lab Sample ID: LCS 500-277526/2-A
Matrix: Water
Analysis Batch: 277560

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 277526

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0992		mg/L		99	90 - 110

Lab Sample ID: 180-41513-1 MS
Matrix: Water
Analysis Batch: 277560

Client Sample ID: OC-FRAC 5-022515
Prep Type: Total/NA
Prep Batch: 277526

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.0050	J	0.100	0.0968		mg/L		92	75 - 125

Lab Sample ID: 180-41513-1 MSD
Matrix: Water
Analysis Batch: 277560

Client Sample ID: OC-FRAC 5-022515
Prep Type: Total/NA
Prep Batch: 277526

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.0050	J	0.100	0.0971		mg/L		92	75 - 125	0	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-277381/1
Matrix: Water
Analysis Batch: 277381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/26/15 15:40	1

Lab Sample ID: LCS 500-277381/2
Matrix: Water
Analysis Batch: 277381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	196		mg/L		98	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-277333/1
Matrix: Water
Analysis Batch: 277333

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			02/26/15 12:25	1

Lab Sample ID: 180-41513-1 DU
Matrix: Water
Analysis Batch: 277333

Client Sample ID: OC-FRAC 5-022515
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 134330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	3520C	
LCS 180-134330/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-134330/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-134330/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 134379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	8270C LL	134330
LCS 180-134330/2-A	Lab Control Sample	Total/NA	Water	8270C LL	134330
LCSD 180-134330/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	134330
MB 180-134330/1-A	Method Blank	Total/NA	Water	8270C LL	134330

HPLC/IC

Analysis Batch: 134309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	300.0	
180-41513-1 MS	OC-FRAC 5-022515	Total/NA	Water	300.0	
180-41513-1 MSD	OC-FRAC 5-022515	Total/NA	Water	300.0	
LCS 180-134309/36	Lab Control Sample	Total/NA	Water	300.0	
MB 180-134309/37	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 134392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total Recoverable	Water	200.7	
LCS 180-134392/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-134392/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-134392/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 134513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total Recoverable	Water	200.7 Rev 4.4	134392
LCS 180-134392/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	134392
LCSD 180-134392/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	134392
MB 180-134392/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	134392

General Chemistry

Analysis Batch: 277333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	SM 4500 Cl F	
180-41513-1 DU	OC-FRAC 5-022515	Total/NA	Water	SM 4500 Cl F	
MB 500-277333/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 277381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	SM 2540D	
LCS 500-277381/2	Lab Control Sample	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 277381 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-277381/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 277526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	Distill/Phenol	
180-41513-1 MS	OC-FRAC 5-022515	Total/NA	Water	Distill/Phenol	
180-41513-1 MSD	OC-FRAC 5-022515	Total/NA	Water	Distill/Phenol	
LCS 500-277526/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-277526/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 277560

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41513-1	OC-FRAC 5-022515	Total/NA	Water	420.4	277526
180-41513-1 MS	OC-FRAC 5-022515	Total/NA	Water	420.4	277526
180-41513-1 MSD	OC-FRAC 5-022515	Total/NA	Water	420.4	277526
LCS 500-277526/2-A	Lab Control Sample	Total/NA	Water	420.4	277526
MB 500-277526/1-A	Method Blank	Total/NA	Water	420.4	277526

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Client Sample ID: OC-FRAC 5-022515 — **Lab Sample ID: 180-41513-1**
Date Collected: 02/25/15 10:00 — **Matrix: Water**
Date Received: 02/26/15 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	134330	02/26/15 12:25	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	134379	02/27/15 19:00	SAB	TAL PIT
		Instrument ID: CH71								
Total/NA	Analysis	300.0		5	1 mL		134309	02/26/15 23:09	MJH	TAL PIT
		Instrument ID: CHIC2100A								
Total Recoverable	Prep	200.7			50 mL	50 mL	134392	02/27/15 08:45	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	134513	03/02/15 07:36	RJR	TAL PIT
		Instrument ID: C								
Total/NA	Prep	Distill/Phenol			100 mL	102 mL	277526	02/27/15 13:16	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	102 mL	277560	02/27/15 14:54	AJR	TAL CHI
		Instrument ID: SEAL2								
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	277381		SMO	TAL CHI
		Instrument ID: NOEQUIP						(Start) 02/26/15 15:49		
								(End) 02/26/15 15:51		
Total/NA	Analysis	SM 4500 Cl F		1			277333	02/26/15 12:26	MTB	TAL CHI
		Instrument ID: NOEQUIP								

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

SAB = Sharon Bacha

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41513-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41513-1	OC-FRAC 5-022515	Water	02/25/15 10:00	02/26/15 10:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Cust

180-41513 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		Other:
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids							Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N							X	
FRAC 5 · 022515	2-25-15	1000	G	Water			X		X	X	X	X	X								
				Water																	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	2-25-15 1700		[signature]	2-25-15 1700	
2	[signature]	2-25-15 1800		[signature]	2-26-15	TAP
3		Date/Time:	Company	Received by:	Date/Time: 1010	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41513-1

Login Number: 41513

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41513-1

Login Number: 41513

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-41615-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/6/2015 4:53:03 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
F1	MS and/or MSD Recovery exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Job ID: 180-41615-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 2/28/2015 9:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.8º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch # 134489.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Client Sample ID: OC-FRAC 3-022715

Lab Sample ID: 180-41615-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.38	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.22	J B	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	140	B	5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	3.6	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	42		20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.029		0.0052	0.0023	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Client Sample ID: OC-FRAC 3-022715
Date Collected: 02/27/15 09:00
Date Received: 02/28/15 09:15

Lab Sample ID: 180-41615-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		03/02/15 08:17	03/03/15 15:03	1
Butyl benzyl phthalate	**0.38**	**J**	0.94	0.13	ug/L		03/02/15 08:17	03/03/15 15:03	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		03/02/15 08:17	03/03/15 15:03	1
Diethyl phthalate	**0.22**	**J B**	0.94	0.14	ug/L		03/02/15 08:17	03/03/15 15:03	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		03/02/15 08:17	03/03/15 15:03	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		03/02/15 08:17	03/03/15 15:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*56*		*28 - 107*	*03/02/15 08:17*	*03/03/15 15:03*	*1*
2-Fluorobiphenyl	*50*		*31 - 100*	*03/02/15 08:17*	*03/03/15 15:03*	*1*
2-Fluorophenol (Surr)	*47*		*20 - 100*	*03/02/15 08:17*	*03/03/15 15:03*	*1*
Nitrobenzene-d5 (Surr)	*52*		*33 - 100*	*03/02/15 08:17*	*03/03/15 15:03*	*1*
Phenol-d5 (Surr)	*51*		*26 - 100*	*03/02/15 08:17*	*03/03/15 15:03*	*1*
Terphenyl-d14	*72*		*20 - 109*	*03/02/15 08:17*	*03/03/15 15:03*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**	**B**	5.0	0.98	mg/L			02/28/15 15:49	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/02/15 09:03	03/03/15 10:56	1
Iron	ND		100	9.5	ug/L		03/02/15 09:03	03/03/15 10:56	1
Nickel	**3.6**	**J**	40	0.51	ug/L		03/02/15 09:03	03/03/15 10:56	1
Zinc	**42**		20	1.0	ug/L		03/02/15 09:03	03/03/15 10:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.029**		0.0052	0.0023	mg/L		03/02/15 11:10	03/02/15 12:15	1
Total Suspended Solids	ND		5.0	1.6	mg/L			03/02/15 11:07	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			03/01/15 11:41	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-41615-1	OC-FRAC 3-022715	56	50	47	52	51	72		
LCS 180-134489/2-A	Lab Control Sample	75	69	73	72	72	73		
LCSD 180-134489/3-A	Lab Control Sample Dup	76	66	68	67	68	67		
MB 180-134489/1-A	Method Blank	60	64	64	66	66	72		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-134489/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 134570 — **Prep Batch: 134489**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		03/02/15 08:17	03/03/15 10:41	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		03/02/15 08:17	03/03/15 10:41	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		03/02/15 08:17	03/03/15 10:41	1
Diethyl phthalate	0.183	J	1.0	0.15	ug/L		03/02/15 08:17	03/03/15 10:41	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		03/02/15 08:17	03/03/15 10:41	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		03/02/15 08:17	03/03/15 10:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*28 - 107*	*03/02/15 08:17*	*03/03/15 10:41*	*1*
2-Fluorobiphenyl	*64*		*31 - 100*	*03/02/15 08:17*	*03/03/15 10:41*	*1*
2-Fluorophenol (Surr)	*64*		*20 - 100*	*03/02/15 08:17*	*03/03/15 10:41*	*1*
Nitrobenzene-d5 (Surr)	*66*		*33 - 100*	*03/02/15 08:17*	*03/03/15 10:41*	*1*
Phenol-d5 (Surr)	*66*		*26 - 100*	*03/02/15 08:17*	*03/03/15 10:41*	*1*
Terphenyl-d14	*72*		*20 - 109*	*03/02/15 08:17*	*03/03/15 10:41*	*1*

Lab Sample ID: LCS 180-134489/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 134570 — **Prep Batch: 134489**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			20.0	14.2		ug/L		71	24 - 129		
Butyl benzyl phthalate			20.0	15.3		ug/L		77	38 - 110		
Di-n-butyl phthalate			20.0	14.3		ug/L		72	42 - 106		
Diethyl phthalate			20.0	14.7		ug/L		74	40 - 106		
Dimethyl phthalate			20.0	13.9		ug/L		70	43 - 100		
Di-n-octyl phthalate			20.0	14.2		ug/L		71	31 - 111		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*75*		*28 - 107*
2-Fluorobiphenyl	*69*		*31 - 100*
2-Fluorophenol (Surr)	*73*		*20 - 100*
Nitrobenzene-d5 (Surr)	*72*		*33 - 100*
Phenol-d5 (Surr)	*72*		*26 - 100*
Terphenyl-d14	*73*		*20 - 109*

Lab Sample ID: LCSD 180-134489/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 134570 — **Prep Batch: 134489**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	13.7		ug/L		68	24 - 129	4	32
Butyl benzyl phthalate			20.0	14.6		ug/L		73	38 - 110	5	18
Di-n-butyl phthalate			20.0	13.9		ug/L		70	42 - 106	3	18
Diethyl phthalate			20.0	13.5		ug/L		68	40 - 106	9	17
Dimethyl phthalate			20.0	13.2		ug/L		66	43 - 100	5	18
Di-n-octyl phthalate			20.0	14.0		ug/L		70	31 - 111	2	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-134489/3-A
Matrix: Water
Analysis Batch: 134570

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 134489

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*28 - 107*
2-Fluorobiphenyl	*66*		*31 - 100*
2-Fluorophenol (Surr)	*68*		*20 - 100*
Nitrobenzene-d5 (Surr)	*67*		*33 - 100*
Phenol-d5 (Surr)	*68*		*26 - 100*
Terphenyl-d14	*67*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-134458/6
Matrix: Water
Analysis Batch: 134458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.286	J	1.0	0.20	mg/L			02/28/15 12:02	1

Lab Sample ID: LCS 180-134458/5
Matrix: Water
Analysis Batch: 134458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.8		mg/L		102	90 - 110

Lab Sample ID: 180-41615-1 MS
Matrix: Water
Analysis Batch: 134458

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	140	B	125	268		mg/L		104	80 - 120

Lab Sample ID: 180-41615-1 MSD
Matrix: Water
Analysis Batch: 134458

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	140	B	125	266		mg/L		102	80 - 120	1	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-134502/1-A
Matrix: Water
Analysis Batch: 134675

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 134502

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/02/15 09:03	03/03/15 10:16	1
Iron	ND		100	9.5	ug/L		03/02/15 09:03	03/03/15 10:16	1
Nickel	ND		40	0.51	ug/L		03/02/15 09:03	03/03/15 10:16	1
Zinc	ND		20	1.0	ug/L		03/02/15 09:03	03/03/15 10:16	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-134502/2-A
Matrix: Water
Analysis Batch: 134675

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 134502

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			500	507		ug/L		101	85 - 115		
Iron			1000	967		ug/L		97	85 - 115		
Nickel			500	484		ug/L		97	85 - 115		
Zinc			500	488		ug/L		98	85 - 115		

Lab Sample ID: LCSD 180-134502/3-A
Matrix: Water
Analysis Batch: 134675

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 134502

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			500	531		ug/L		106	85 - 115	5	20
Iron			1000	1010		ug/L		101	85 - 115	4	20
Nickel			500	506		ug/L		101	85 - 115	4	20
Zinc			500	508		ug/L		102	85 - 115	4	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-277704/11-A
Matrix: Water
Analysis Batch: 277753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 277704

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		03/02/15 11:10	03/02/15 12:13	1

Lab Sample ID: LCS 500-277704/12-A
Matrix: Water
Analysis Batch: 277753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 277704

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Phenolics, Total Recoverable			0.100	0.0950		mg/L		95	90 - 110		

Lab Sample ID: 180-41615-1 MS
Matrix: Water
Analysis Batch: 277753

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA
Prep Batch: 277704

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Phenolics, Total Recoverable	0.029		0.100	0.0980	F1	mg/L		69	75 - 125		

Lab Sample ID: 180-41615-1 MSD
Matrix: Water
Analysis Batch: 277753

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA
Prep Batch: 277704

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.029		0.100	0.0966	F1	mg/L		67	75 - 125	1	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-277711/1
Matrix: Water
Analysis Batch: 277711

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			03/02/15 10:50	1

Lab Sample ID: LCS 500-277711/2
Matrix: Water
Analysis Batch: 277711

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	177		mg/L		89	80 - 120

Lab Sample ID: 180-41615-1 DU
Matrix: Water
Analysis Batch: 277711

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	5

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-277655/1
Matrix: Water
Analysis Batch: 277655

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			03/01/15 11:40	1

Lab Sample ID: 180-41615-1 DU
Matrix: Water
Analysis Batch: 277655

Client Sample ID: OC-FRAC 3-022715
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 134489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	3520C	
LCS 180-134489/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-134489/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-134489/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 134570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	8270C LL	134489
LCS 180-134489/2-A	Lab Control Sample	Total/NA	Water	8270C LL	134489
LCSD 180-134489/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	134489
MB 180-134489/1-A	Method Blank	Total/NA	Water	8270C LL	134489

HPLC/IC

Analysis Batch: 134458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	300.0	
180-41615-1 MS	OC-FRAC 3-022715	Total/NA	Water	300.0	
180-41615-1 MSD	OC-FRAC 3-022715	Total/NA	Water	300.0	
LCS 180-134458/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-134458/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 134502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total Recoverable	Water	200.7	
LCS 180-134502/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
LCSD 180-134502/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7	
MB 180-134502/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 134675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total Recoverable	Water	200.7 Rev 4.4	134502
LCS 180-134502/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	134502
LCSD 180-134502/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.7 Rev 4.4	134502
MB 180-134502/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	134502

General Chemistry

Analysis Batch: 277655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	SM 4500 Cl F	
180-41615-1 DU	OC-FRAC 3-022715	Total/NA	Water	SM 4500 Cl F	
MB 500-277655/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 277704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	Distill/Phenol	
180-41615-1 MS	OC-FRAC 3-022715	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 277704 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1 MSD	OC-FRAC 3-022715	Total/NA	Water	Distill/Phenol	
LCS 500-277704/12-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-277704/11-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 277711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	SM 2540D	
180-41615-1 DU	OC-FRAC 3-022715	Total/NA	Water	SM 2540D	
LCS 500-277711/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-277711/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 277753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-41615-1	OC-FRAC 3-022715	Total/NA	Water	420.4	277704
180-41615-1 MS	OC-FRAC 3-022715	Total/NA	Water	420.4	277704
180-41615-1 MSD	OC-FRAC 3-022715	Total/NA	Water	420.4	277704
LCS 500-277704/12-A	Lab Control Sample	Total/NA	Water	420.4	277704
MB 500-277704/11-A	Method Blank	Total/NA	Water	420.4	277704

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Client Sample ID: OC-FRAC 3-022715 — **Lab Sample ID: 180-41615-1**
Date Collected: 02/27/15 09:00 — **Matrix: Water**
Date Received: 02/28/15 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	134489	03/02/15 08:17	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	134570	03/03/15 15:03	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		5	1 mL		134458	02/28/15 15:49	JMO	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	134502	03/02/15 09:03	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	134675	03/03/15 10:56	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	104 mL	277704	03/02/15 11:10	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	104 mL	277753	03/02/15 12:15	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	277711		JBJ	TAL CHI
	Instrument ID: NOEQUIP							(Start) 03/02/15 11:07		
								(End) 03/02/15 11:10		
Total/NA	Analysis	SM 4500 Cl F		1			277655	03/01/15 11:41	LAJ	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

JBJ = Jaclyn Johnson

LAJ = Lara Jones

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

JMO = John Oravec

RJG = Rob Good

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15 *
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	03-31-15 *
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-41615-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-41615-1	OC-FRAC 3-022715	Water	02/27/15 09:00	02/28/15 09:15

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL M - Hexane
N - None
Other:

180-41615 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC3-022715	2-27-15	0900	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	2-27-15 1600			2-27-15 1600	
2		2-27-15 1700			2-28-15	
3		Date/Time:	Company	Received by:	Date/Time: 9:15	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41615-1

Login Number: 41615

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Watson, Debbie

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-41615-1

Login Number: 41615

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-42272-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/26/2015 4:27:07 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Job ID: 180-42272-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 3/21/2015 at 10:15 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 180-136253.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15 *
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15 *
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15 *
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15 *
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15 *
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-16
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	03-31-15 *
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-42272-1	OC-INF 32015	Water	03/20/15 09:45	03/21/15 10:15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Client Sample ID: OC-INF 32015
Date Collected: 03/20/15 09:45
Date Received: 03/21/15 10:15

Lab Sample ID: 180-42272-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	136253	03/23/15 10:37	JPM	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	136482	03/25/15 12:13	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		1	1 mL		136165	03/21/15 23:04	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	136352	03/24/15 08:14	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	136541	03/25/15 08:24	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	103 mL	281101	03/25/15 10:25	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	103 mL	281132	03/25/15 11:48	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	280796		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 03/23/15 11:59		
								(End) 03/23/15 12:01		
Total/NA	Analysis	SM 4500 Cl F		1			280749	03/21/15 10:41	MTB	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

MTB = Mary Brogan

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

JPM = Jeremy Merriman

Batch Type: Analysis

MJH = Matthew Hartman

RJG = Rob Good

VVP = Vincent Piccolino

Client Sample ID: OC-INF 32015
Date Collected: 03/20/15 09:45
Date Received: 03/21/15 10:15

Lab Sample ID: 180-42272-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**11**		1.9	1.2	ug/L		03/23/15 10:37	03/25/15 12:13	1
Butyl benzyl phthalate	**0.67**	**J**	0.94	0.13	ug/L		03/23/15 10:37	03/25/15 12:13	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		03/23/15 10:37	03/25/15 12:13	1
Diethyl phthalate	**0.51**	**J**	0.94	0.14	ug/L		03/23/15 10:37	03/25/15 12:13	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		03/23/15 10:37	03/25/15 12:13	1
Di-n-octyl phthalate	**0.20**	**J**	0.94	0.19	ug/L		03/23/15 10:37	03/25/15 12:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*28 - 107*	*03/23/15 10:37*	*03/25/15 12:13*	*1*
2-Fluorobiphenyl	*56*		*31 - 100*	*03/23/15 10:37*	*03/25/15 12:13*	*1*
2-Fluorophenol (Surr)	*47*		*20 - 100*	*03/23/15 10:37*	*03/25/15 12:13*	*1*
Nitrobenzene-d5 (Surr)	*57*		*33 - 100*	*03/23/15 10:37*	*03/25/15 12:13*	*1*
Phenol-d5 (Surr)	*53*		*26 - 100*	*03/23/15 10:37*	*03/25/15 12:13*	*1*
Terphenyl-d14	*66*		*20 - 109*	*03/23/15 10:37*	*03/25/15 12:13*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**120**	**B**	1.0	0.20	mg/L			03/21/15 23:04	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**12**		10	3.0	ug/L		03/24/15 08:14	03/25/15 08:24	1
Iron	**11000**		100	9.5	ug/L		03/24/15 08:14	03/25/15 08:24	1
Nickel	**0.56**	**J**	40	0.51	ug/L		03/24/15 08:14	03/25/15 08:24	1
Zinc	**4.4**	**J**	20	1.0	ug/L		03/24/15 08:14	03/25/15 08:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0026**	**J**	0.0052	0.0023	mg/L		03/25/15 10:25	03/25/15 11:48	1
Total Suspended Solids	**15**		5.0	1.6	mg/L			03/23/15 11:59	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			03/21/15 10:41	1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-136253/1-A
Matrix: Water
Analysis Batch: 136343

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 136253

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		03/23/15 10:37	03/24/15 11:26	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		03/23/15 10:37	03/24/15 11:26	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		03/23/15 10:37	03/24/15 11:26	1
Diethyl phthalate	ND		1.0	0.15	ug/L		03/23/15 10:37	03/24/15 11:26	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		03/23/15 10:37	03/24/15 11:26	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		03/23/15 10:37	03/24/15 11:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*73*		*28 - 107*	*03/23/15 10:37*	*03/24/15 11:26*	*1*
2-Fluorobiphenyl	*73*		*31 - 100*	*03/23/15 10:37*	*03/24/15 11:26*	*1*
2-Fluorophenol (Surr)	*72*		*20 - 100*	*03/23/15 10:37*	*03/24/15 11:26*	*1*
Nitrobenzene-d5 (Surr)	*71*		*33 - 100*	*03/23/15 10:37*	*03/24/15 11:26*	*1*
Phenol-d5 (Surr)	*78*		*26 - 100*	*03/23/15 10:37*	*03/24/15 11:26*	*1*
Terphenyl-d14	*83*		*20 - 109*	*03/23/15 10:37*	*03/24/15 11:26*	*1*

Lab Sample ID: LCS 180-136253/2-A
Matrix: Water
Analysis Batch: 136343

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 136253

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.8		ug/L		74	24 - 129
Butyl benzyl phthalate	20.0	14.6		ug/L		73	38 - 110
Di-n-butyl phthalate	20.0	14.3		ug/L		72	42 - 106
Diethyl phthalate	20.0	13.5		ug/L		68	40 - 106
Dimethyl phthalate	20.0	13.6		ug/L		68	43 - 100
Di-n-octyl phthalate	20.0	15.5		ug/L		77	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*28 - 107*
2-Fluorobiphenyl	*64*		*31 - 100*
2-Fluorophenol (Surr)	*59*		*20 - 100*
Nitrobenzene-d5 (Surr)	*63*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*68*		*20 - 109*

Lab Sample ID: LCSD 180-136253/3-A
Matrix: Water
Analysis Batch: 136343

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 136253

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.8		ug/L		74	24 - 129	0	32
Butyl benzyl phthalate	20.0	14.6		ug/L		73	38 - 110	0	18
Di-n-butyl phthalate	20.0	14.2		ug/L		71	42 - 106	1	18
Diethyl phthalate	20.0	13.4		ug/L		67	40 - 106	1	17
Dimethyl phthalate	20.0	13.3		ug/L		67	43 - 100	2	18
Di-n-octyl phthalate	20.0	15.1		ug/L		76	31 - 111	2	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-136253/3-A
Matrix: Water
Analysis Batch: 136343

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 136253

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*28 - 107*
2-Fluorobiphenyl	*63*		*31 - 100*
2-Fluorophenol (Surr)	*60*		*20 - 100*
Nitrobenzene-d5 (Surr)	*61*		*33 - 100*
Phenol-d5 (Surr)	*63*		*26 - 100*
Terphenyl-d14	*68*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-136165/6
Matrix: Water
Analysis Batch: 136165

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.410	J	1.0	0.20	mg/L			03/21/15 15:32	1

Lab Sample ID: LCS 180-136165/5
Matrix: Water
Analysis Batch: 136165

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.3		mg/L		103	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-136352/1-A
Matrix: Water
Analysis Batch: 136541

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 136352

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/24/15 08:14	03/25/15 07:29	1
Iron	ND		100	9.5	ug/L		03/24/15 08:14	03/25/15 07:29	1
Nickel	ND		40	0.51	ug/L		03/24/15 08:14	03/25/15 07:29	1
Zinc	ND		20	1.0	ug/L		03/24/15 08:14	03/25/15 07:29	1

Lab Sample ID: LCS 180-136352/2-A
Matrix: Water
Analysis Batch: 136541

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 136352

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	521		ug/L		104	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	498		ug/L		100	85 - 115
Zinc	500	504		ug/L		101	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-42272-1 MS — **Client Sample ID: OC-INF 32015**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 136541 — **Prep Batch: 136352**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	12		500	531		ug/L		104	70 - 130
Iron	11000		1000	12300	4	ug/L		112	70 - 130
Nickel	0.56	J	500	493		ug/L		98	70 - 130
Zinc	4.4	J	500	491		ug/L		97	70 - 130

Lab Sample ID: 180-42272-1 MSD — **Client Sample ID: OC-INF 32015**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 136541 — **Prep Batch: 136352**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	12		500	529		ug/L		103	70 - 130	0	20
Iron	11000		1000	12200	4	ug/L		107	70 - 130	0	20
Nickel	0.56	J	500	494		ug/L		99	70 - 130	0	20
Zinc	4.4	J	500	491		ug/L		97	70 - 130	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-281101/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281132 — **Prep Batch: 281101**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0052	0.0023	mg/L		03/25/15 10:25	03/25/15 11:46	1

Lab Sample ID: LCS 500-281101/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281132 — **Prep Batch: 281101**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0945		mg/L		95	90 - 110

Lab Sample ID: 180-42272-1 MS — **Client Sample ID: OC-INF 32015**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281132 — **Prep Batch: 281101**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.0026	J	0.100	0.0991		mg/L		97	75 - 125

Lab Sample ID: 180-42272-1 MSD — **Client Sample ID: OC-INF 32015**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281132 — **Prep Batch: 281101**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.0026	J	0.100	0.100		mg/L		98	75 - 125	1	20

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42272-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-280796/1
Matrix: Water
Analysis Batch: 280796

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			03/23/15 11:45	1

Lab Sample ID: LCS 500-280796/2
Matrix: Water
Analysis Batch: 280796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	180		mg/L		90	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-280749/1
Matrix: Water
Analysis Batch: 280749

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			03/21/15 10:40	1

Lab Sample ID: 180-42272-1 DU
Matrix: Water
Analysis Batch: 280749

Client Sample ID: OC-INF 32015
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 136253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	3520C	
LCS 180-136253/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-136253/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-136253/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 136343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-136253/2-A	Lab Control Sample	Total/NA	Water	8270C LL	136253
LCSD 180-136253/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	136253
MB 180-136253/1-A	Method Blank	Total/NA	Water	8270C LL	136253

Analysis Batch: 136482

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	8270C LL	136253

HPLC/IC

Analysis Batch: 136165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	300.0	
LCS 180-136165/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-136165/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 136352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total Recoverable	Water	200.7	
180-42272-1 MS	OC-INF 32015	Total Recoverable	Water	200.7	
180-42272-1 MSD	OC-INF 32015	Total Recoverable	Water	200.7	
LCS 180-136352/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-136352/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 136541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total Recoverable	Water	200.7 Rev 4.4	136352
180-42272-1 MS	OC-INF 32015	Total Recoverable	Water	200.7 Rev 4.4	136352
180-42272-1 MSD	OC-INF 32015	Total Recoverable	Water	200.7 Rev 4.4	136352
LCS 180-136352/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	136352
MB 180-136352/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	136352

General Chemistry

Analysis Batch: 280749

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	SM 4500 Cl F	
180-42272-1 DU	OC-INF 32015	Total/NA	Water	SM 4500 Cl F	
MB 500-280749/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 280796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	SM 2540D	
LCS 500-280796/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-280796/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 281101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	Distill/Phenol	
180-42272-1 MS	OC-INF 32015	Total/NA	Water	Distill/Phenol	
180-42272-1 MSD	OC-INF 32015	Total/NA	Water	Distill/Phenol	
LCS 500-281101/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-281101/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 281132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42272-1	OC-INF 32015	Total/NA	Water	420.4	281101
180-42272-1 MS	OC-INF 32015	Total/NA	Water	420.4	281101
180-42272-1 MSD	OC-INF 32015	Total/NA	Water	420.4	281101
LCS 500-281101/2-A	Lab Control Sample	Total/NA	Water	420.4	281101
MB 500-281101/1-A	Method Blank	Total/NA	Water	420.4	281101

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

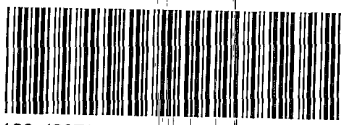
TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978-658-6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
INF 32015	3-20-15	0945	G	Water			X		X	X	X	X	X		
				Water											



180-42272 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	3-20-15		[signature]	3-20-15 1200	TA
[signature]	3-20-15 1700	TA	[signature]	3-20-15 ~~[illegible]~~	TAP-15
				1016	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		MAL 3/20/15

3/26/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42272-1

Login Number: 42272

List Source: TestAmerica Pittsburgh

List Number: 1

Creator: Lonzo, Michael A

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42272-1

Login Number: 42272

List Number: 2

Creator: Lonzo, Michael A

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42272-1

Login Number: 42272
List Number: 3
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago
List Creation: 03/23/15 09:45 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-42451-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/31/2015 4:28:45 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Job ID: 180-42451-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 3/27/2015 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.7º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Client Sample ID: OC-FRAC 2- 032615

Lab Sample ID: 180-42451-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	2.3		1.9	1.2	ug/L	1		8270C LL	Total/NA
Butyl benzyl phthalate	0.74	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Di-n-octyl phthalate	0.23	J	0.94	0.19	ug/L	1		8270C LL	Total/NA
Chloride	130		5.0	0.98	mg/L	5		300.0	Total/NA
Iron	27	J	100	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	1.4	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	6.6	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Client Sample ID: OC-FRAC 2- 032615
Date Collected: 03/26/15 09:00
Date Received: 03/27/15 09:30

Lab Sample ID: 180-42451-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**2.3**		1.9	1.2	ug/L		03/27/15 14:24	03/30/15 18:26	1
Butyl benzyl phthalate	**0.74**	**J**	0.94	0.13	ug/L		03/27/15 14:24	03/30/15 18:26	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		03/27/15 14:24	03/30/15 18:26	1
Diethyl phthalate	ND		0.94	0.14	ug/L		03/27/15 14:24	03/30/15 18:26	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		03/27/15 14:24	03/30/15 18:26	1
Di-n-octyl phthalate	**0.23**	**J**	0.94	0.19	ug/L		03/27/15 14:24	03/30/15 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*28 - 107*	*03/27/15 14:24*	*03/30/15 18:26*	*1*
2-Fluorobiphenyl	*58*		*31 - 100*	*03/27/15 14:24*	*03/30/15 18:26*	*1*
2-Fluorophenol (Surr)	*53*		*20 - 100*	*03/27/15 14:24*	*03/30/15 18:26*	*1*
Nitrobenzene-d5 (Surr)	*59*		*33 - 100*	*03/27/15 14:24*	*03/30/15 18:26*	*1*
Phenol-d5 (Surr)	*59*		*26 - 100*	*03/27/15 14:24*	*03/30/15 18:26*	*1*
Terphenyl-d14	*64*		*20 - 109*	*03/27/15 14:24*	*03/30/15 18:26*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		5.0	0.98	mg/L			03/27/15 18:59	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/30/15 09:13	03/31/15 09:02	1
Iron	**27**	**J**	100	9.5	ug/L		03/30/15 09:13	03/31/15 09:02	1
Nickel	**1.4**	**J**	40	0.51	ug/L		03/30/15 09:13	03/31/15 09:02	1
Zinc	**6.6**	**J**	20	1.0	ug/L		03/30/15 09:13	03/31/15 09:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		03/31/15 08:14	03/31/15 13:33	1
Total Suspended Solids	ND		5.0	1.6	mg/L			03/30/15 09:10	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			03/27/15 11:51	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-42451-1	OC-FRAC 2- 032615	61	58	53	59	59	64		
LCS 180-136815/2-A	Lab Control Sample	68	64	63	63	64	65		
LCSD 180-136815/3-A	Lab Control Sample Dup	73	70	67	71	68	70		
MB 180-136815/1-A	Method Blank	62	64	61	63	64	72		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-136815/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 136913 — **Prep Batch: 136815**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		03/27/15 14:24	03/30/15 12:04	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		03/27/15 14:24	03/30/15 12:04	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		03/27/15 14:24	03/30/15 12:04	1
Diethyl phthalate	0.324	J	1.0	0.15	ug/L		03/27/15 14:24	03/30/15 12:04	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		03/27/15 14:24	03/30/15 12:04	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		03/27/15 14:24	03/30/15 12:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*62*		*28 - 107*	*03/27/15 14:24*	*03/30/15 12:04*	*1*
2-Fluorobiphenyl	*64*		*31 - 100*	*03/27/15 14:24*	*03/30/15 12:04*	*1*
2-Fluorophenol (Surr)	*61*		*20 - 100*	*03/27/15 14:24*	*03/30/15 12:04*	*1*
Nitrobenzene-d5 (Surr)	*63*		*33 - 100*	*03/27/15 14:24*	*03/30/15 12:04*	*1*
Phenol-d5 (Surr)	*64*		*26 - 100*	*03/27/15 14:24*	*03/30/15 12:04*	*1*
Terphenyl-d14	*72*		*20 - 109*	*03/27/15 14:24*	*03/30/15 12:04*	*1*

Lab Sample ID: LCS 180-136815/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 136913 — **Prep Batch: 136815**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.2		ug/L		71	24 - 129
Butyl benzyl phthalate	20.0	13.8		ug/L		69	38 - 110
Di-n-butyl phthalate	20.0	13.7		ug/L		68	42 - 106
Diethyl phthalate	20.0	13.2		ug/L		66	40 - 106
Dimethyl phthalate	20.0	13.0		ug/L		65	43 - 100
Di-n-octyl phthalate	20.0	14.0		ug/L		70	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*28 - 107*
2-Fluorobiphenyl	*64*		*31 - 100*
2-Fluorophenol (Surr)	*63*		*20 - 100*
Nitrobenzene-d5 (Surr)	*63*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*65*		*20 - 109*

Lab Sample ID: LCSD 180-136815/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 136913 — **Prep Batch: 136815**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		77	24 - 129	8	32
Butyl benzyl phthalate	20.0	14.8		ug/L		74	38 - 110	7	18
Di-n-butyl phthalate	20.0	15.1		ug/L		75	42 - 106	10	18
Diethyl phthalate	20.0	14.4		ug/L		72	40 - 106	9	17
Dimethyl phthalate	20.0	14.3		ug/L		71	43 - 100	9	18
Di-n-octyl phthalate	20.0	15.5		ug/L		77	31 - 111	10	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-136815/3-A
Matrix: Water
Analysis Batch: 136913

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 136815

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*28 - 107*
2-Fluorobiphenyl	*70*		*31 - 100*
2-Fluorophenol (Surr)	*67*		*20 - 100*
Nitrobenzene-d5 (Surr)	*71*		*33 - 100*
Phenol-d5 (Surr)	*68*		*26 - 100*
Terphenyl-d14	*70*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-136796/12
Matrix: Water
Analysis Batch: 136796

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			03/27/15 15:31	1

Lab Sample ID: LCS 180-136796/11
Matrix: Water
Analysis Batch: 136796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	46.1		mg/L		92	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-136936/1-A
Matrix: Water
Analysis Batch: 137095

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 136936

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/30/15 09:13	03/31/15 08:52	1
Iron	ND		100	9.5	ug/L		03/30/15 09:13	03/31/15 08:52	1
Nickel	ND		40	0.51	ug/L		03/30/15 09:13	03/31/15 08:52	1
Zinc	ND		20	1.0	ug/L		03/30/15 09:13	03/31/15 08:52	1

Lab Sample ID: LCS 180-136936/2-A
Matrix: Water
Analysis Batch: 137095

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 136936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	505		ug/L		101	85 - 115
Iron	1000	997		ug/L		100	85 - 115
Nickel	500	488		ug/L		98	85 - 115
Zinc	500	493		ug/L		99	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-281826/1-A
Matrix: Water
Analysis Batch: 281908

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 281826

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		03/31/15 08:14	03/31/15 13:27	1

Lab Sample ID: LCS 500-281826/2-A
Matrix: Water
Analysis Batch: 281908

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281826

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0899		mg/L		90	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-281680/1
Matrix: Water
Analysis Batch: 281680

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			03/30/15 08:55	1

Lab Sample ID: LCS 500-281680/2
Matrix: Water
Analysis Batch: 281680

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	195		mg/L		97	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-281519/1
Matrix: Water
Analysis Batch: 281519

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			03/27/15 11:50	1

Lab Sample ID: 180-42451-1 DU
Matrix: Water
Analysis Batch: 281519

Client Sample ID: OC-FRAC 2- 032615
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 136815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	3520C	
LCS 180-136815/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-136815/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-136815/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 136913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	8270C LL	136815
LCS 180-136815/2-A	Lab Control Sample	Total/NA	Water	8270C LL	136815
LCSD 180-136815/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	136815
MB 180-136815/1-A	Method Blank	Total/NA	Water	8270C LL	136815

HPLC/IC

Analysis Batch: 136796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	300.0	
LCS 180-136796/11	Lab Control Sample	Total/NA	Water	300.0	
MB 180-136796/12	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 136936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total Recoverable	Water	200.7	
LCS 180-136936/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-136936/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 137095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total Recoverable	Water	200.7 Rev 4.4	136936
LCS 180-136936/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	136936
MB 180-136936/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	136936

General Chemistry

Analysis Batch: 281519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	SM 4500 Cl F	
180-42451-1 DU	OC-FRAC 2- 032615	Total/NA	Water	SM 4500 Cl F	
MB 500-281519/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 281680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	SM 2540D	
LCS 500-281680/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-281680/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 281826

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	Distill/Phenol	
LCS 500-281826/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-281826/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 281908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42451-1	OC-FRAC 2- 032615	Total/NA	Water	420.4	281826
LCS 500-281826/2-A	Lab Control Sample	Total/NA	Water	420.4	281826
MB 500-281826/1-A	Method Blank	Total/NA	Water	420.4	281826

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Client Sample ID: OC-FRAC 2- 032615

Lab Sample ID: 180-42451-1

Date Collected: 03/26/15 09:00

Matrix: Water

Date Received: 03/27/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	136815	03/27/15 14:24	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	136913	03/30/15 18:26	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		5	1 mL		136796	03/27/15 18:59	CMR	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	136936	03/30/15 09:13	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	137095	03/31/15 09:02	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	281826	03/31/15 08:14	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	281908	03/31/15 13:33	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	281680		SMO	TAL CHI
	Instrument ID: NOEQUIP							(Start) 03/30/15 09:10		
								(End) 03/30/15 09:12		
Total/NA	Analysis	SM 4500 Cl F		1			281519	03/27/15 11:51	LAJ	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

LAJ = Lara Jones

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

CMR = Carl Reagle

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15 *
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	04-30-15 *
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15 *
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15 *
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15 *
South Carolina	State Program	4	89014	04-30-15 *
Texas	NELAP	6	T104704528	03-31-16
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P-Soil-01	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	04-30-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	04-01-16
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42451-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-42451-1	OC-FRAC 2- 032615	Water	03/26/15 09:00	03/27/15 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

180-42451 Chain of Custody

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier:
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	

Page 1 of 1

Company: Olin Corporation	Due Date Requested:	Job #:
Address: 51 Eames street	TAT Requested (days): A.S.A.P.	
City: Wilmington		
State, Zip: MA, 01887	PO #: REWI0020	
Phone: 978-658-6121	WO #:	
Email: beguichard@olin.com		
Project Name: Wilmington Plant B RPG	Project #: 48006853	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	D	S	N	N	X	
FRAC2-032615	3-26-15	0900	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: L Johnson	Date/Time: 3-26-15	Company	Received by:	Date/Time: 3-26-15 1140	Company FE
Relinquished by:	Date/Time: 3-26-15	Company	Received by: Debbie Watson	Date/Time: 3-27-15	Company TAP
Relinquished by	Date/Time:	Company	Received by:	Date/Time: 9:30	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

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3/31/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42451-1

Login Number: 42451

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42451-1

Login Number: 42451

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 180-42506-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
4/1/2015 10:24:33 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Job ID: 180-42506-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 3/28/2015 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.7º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Client Sample ID: OC-FRAC 1-032715

Lab Sample ID: 180-42506-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	2.1		1.9	1.2	ug/L	1		8270C LL	Total/NA
Butyl benzyl phthalate	0.48	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	140	B	2.5	0.49	mg/L	2.5		300.0	Total/NA
Iron	11	J	100	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.65	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	7.5	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Client Sample ID: OC-FRAC 1-032715
Date Collected: 03/27/15 09:00
Date Received: 03/28/15 09:30

Lab Sample ID: 180-42506-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**2.1**		1.9	1.2	ug/L		03/30/15 08:23	03/31/15 09:43	1
Butyl benzyl phthalate	**0.48**	**J**	0.94	0.13	ug/L		03/30/15 08:23	03/31/15 09:43	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		03/30/15 08:23	03/31/15 09:43	1
Diethyl phthalate	ND		0.94	0.14	ug/L		03/30/15 08:23	03/31/15 09:43	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		03/30/15 08:23	03/31/15 09:43	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		03/30/15 08:23	03/31/15 09:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*28 - 107*	*03/30/15 08:23*	*03/31/15 09:43*	*1*
2-Fluorobiphenyl	*63*		*31 - 100*	*03/30/15 08:23*	*03/31/15 09:43*	*1*
2-Fluorophenol (Surr)	*61*		*20 - 100*	*03/30/15 08:23*	*03/31/15 09:43*	*1*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*	*03/30/15 08:23*	*03/31/15 09:43*	*1*
Phenol-d5 (Surr)	*66*		*26 - 100*	*03/30/15 08:23*	*03/31/15 09:43*	*1*
Terphenyl-d14	*81*		*20 - 109*	*03/30/15 08:23*	*03/31/15 09:43*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**	**B**	2.5	0.49	mg/L			03/28/15 14:32	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/30/15 09:13	03/31/15 09:12	1
Iron	**11**	**J**	100	9.5	ug/L		03/30/15 09:13	03/31/15 09:12	1
Nickel	**0.65**	**J**	40	0.51	ug/L		03/30/15 09:13	03/31/15 09:12	1
Zinc	**7.5**	**J**	20	1.0	ug/L		03/30/15 09:13	03/31/15 09:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		03/31/15 08:14	03/31/15 13:30	1
Total Suspended Solids	ND		5.0	1.6	mg/L			03/30/15 15:22	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			03/28/15 11:16	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-42506-1	OC-FRAC 1-032715	72	63	61	70	66	81		
LCS 180-136919/2-A	Lab Control Sample	70	63	65	72	65	67		
MB 180-136919/1-A	Method Blank	65	64	65	70	63	71		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-136919/1-A
Matrix: Water
Analysis Batch: 137019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 136919

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		03/30/15 08:21	03/31/15 08:47	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		03/30/15 08:21	03/31/15 08:47	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		03/30/15 08:21	03/31/15 08:47	1
Diethyl phthalate	ND		1.0	0.15	ug/L		03/30/15 08:21	03/31/15 08:47	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		03/30/15 08:21	03/31/15 08:47	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		03/30/15 08:21	03/31/15 08:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*28 - 107*	*03/30/15 08:21*	*03/31/15 08:47*	*1*
2-Fluorobiphenyl	*64*		*31 - 100*	*03/30/15 08:21*	*03/31/15 08:47*	*1*
2-Fluorophenol (Surr)	*65*		*20 - 100*	*03/30/15 08:21*	*03/31/15 08:47*	*1*
Nitrobenzene-d5 (Surr)	*70*		*33 - 100*	*03/30/15 08:21*	*03/31/15 08:47*	*1*
Phenol-d5 (Surr)	*63*		*26 - 100*	*03/30/15 08:21*	*03/31/15 08:47*	*1*
Terphenyl-d14	*71*		*20 - 109*	*03/30/15 08:21*	*03/31/15 08:47*	*1*

Lab Sample ID: LCS 180-136919/2-A
Matrix: Water
Analysis Batch: 137019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 136919

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	13.2		ug/L		66	24 - 129
Butyl benzyl phthalate	20.0	13.7		ug/L		68	38 - 110
Di-n-butyl phthalate	20.0	14.3		ug/L		72	42 - 106
Diethyl phthalate	20.0	13.7		ug/L		68	40 - 106
Dimethyl phthalate	20.0	13.0		ug/L		65	43 - 100
Di-n-octyl phthalate	20.0	13.1		ug/L		65	31 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*28 - 107*
2-Fluorobiphenyl	*63*		*31 - 100*
2-Fluorophenol (Surr)	*65*		*20 - 100*
Nitrobenzene-d5 (Surr)	*72*		*33 - 100*
Phenol-d5 (Surr)	*65*		*26 - 100*
Terphenyl-d14	*67*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-136855/6
Matrix: Water
Analysis Batch: 136855

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.375	J	1.0	0.20	mg/L			03/28/15 12:24	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-136855/5
Matrix: Water
Analysis Batch: 136855

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.8		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-136936/1-A
Matrix: Water
Analysis Batch: 137095

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 136936

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		03/30/15 09:13	03/31/15 08:52	1
Iron	ND		100	9.5	ug/L		03/30/15 09:13	03/31/15 08:52	1
Nickel	ND		40	0.51	ug/L		03/30/15 09:13	03/31/15 08:52	1
Zinc	ND		20	1.0	ug/L		03/30/15 09:13	03/31/15 08:52	1

Lab Sample ID: LCS 180-136936/2-A
Matrix: Water
Analysis Batch: 137095

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 136936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	505		ug/L		101	85 - 115
Iron	1000	997		ug/L		100	85 - 115
Nickel	500	488		ug/L		98	85 - 115
Zinc	500	493		ug/L		99	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-281826/1-A
Matrix: Water
Analysis Batch: 281908

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 281826

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		03/31/15 08:14	03/31/15 13:27	1

Lab Sample ID: LCS 500-281826/2-A
Matrix: Water
Analysis Batch: 281908

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281826

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0899		mg/L		90	90 - 110

Lab Sample ID: 180-42506-1 MS
Matrix: Water
Analysis Batch: 281908

Client Sample ID: OC-FRAC 1-032715
Prep Type: Total/NA
Prep Batch: 281826

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.100	0.0947		mg/L		95	75 - 125

Method: 420.4 - Phenolics, Total Recoverable (Continued)

Lab Sample ID: 180-42506-1 MSD — **Client Sample ID: OC-FRAC 1-032715**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281908 — **Prep Batch: 281826**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.100	0.0931		mg/L		93	75 - 125	2	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-281755/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281755

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			03/30/15 15:15	1

Lab Sample ID: LCS 500-281755/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281755

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	214		mg/L		107	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-281577/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			03/28/15 11:15	1

Lab Sample ID: 180-42506-1 DU — **Client Sample ID: OC-FRAC 1-032715**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281577

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 136919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	3520C	
LCS 180-136919/2-A	Lab Control Sample	Total/NA	Water	3520C	
MB 180-136919/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 137019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	8270C LL	136919
LCS 180-136919/2-A	Lab Control Sample	Total/NA	Water	8270C LL	136919
MB 180-136919/1-A	Method Blank	Total/NA	Water	8270C LL	136919

HPLC/IC

Analysis Batch: 136855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	300.0	
LCS 180-136855/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-136855/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 136936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total Recoverable	Water	200.7	
LCS 180-136936/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-136936/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 137095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total Recoverable	Water	200.7 Rev 4.4	136936
LCS 180-136936/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	136936
MB 180-136936/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	136936

General Chemistry

Analysis Batch: 281577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	SM 4500 Cl F	
180-42506-1 DU	OC-FRAC 1-032715	Total/NA	Water	SM 4500 Cl F	
MB 500-281577/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Analysis Batch: 281755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	SM 2540D	
LCS 500-281755/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-281755/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 281826

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	Distill/Phenol	
180-42506-1 MS	OC-FRAC 1-032715	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 281826 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1 MSD	OC-FRAC 1-032715	Total/NA	Water	Distill/Phenol	
LCS 500-281826/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-281826/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 281908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42506-1	OC-FRAC 1-032715	Total/NA	Water	420.4	281826
180-42506-1 MS	OC-FRAC 1-032715	Total/NA	Water	420.4	281826
180-42506-1 MSD	OC-FRAC 1-032715	Total/NA	Water	420.4	281826
LCS 500-281826/2-A	Lab Control Sample	Total/NA	Water	420.4	281826
MB 500-281826/1-A	Method Blank	Total/NA	Water	420.4	281826

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Client Sample ID: OC-FRAC 1-032715 — **Lab Sample ID: 180-42506-1**
Date Collected: 03/27/15 09:00 — **Matrix: Water**
Date Received: 03/28/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	136919	03/30/15 08:23	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	137019	03/31/15 09:43	VVP	TAL PIT
	Instrument ID: CH731									
Total/NA	Analysis	300.0		2.5	1 mL		136855	03/28/15 14:32	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	200.7			50 mL	50 mL	136936	03/30/15 09:13	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	137095	03/31/15 09:12	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	281826	03/31/15 08:14	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	281908	03/31/15 13:30	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	281755		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	03/30/15 15:22		
							(End)	03/30/15 15:24		
Total/NA	Analysis	SM 4500 Cl F		1			281577	03/28/15 11:16	LAJ	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

LAJ = Lara Jones

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15 *
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	04-30-15 *
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15 *
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15 *
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15 *
South Carolina	State Program	4	89014	04-30-15 *
Texas	NELAP	6	T104704528	03-31-16
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P-Soil-01	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	04-30-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	04-01-16
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42506-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-42506-1	OC-FRAC 1-032715	Water	03/27/15 09:00	03/28/15 09:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custc

180-42506 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 1- 032715	3-27-15	0900	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	3-27-15		[signature]	3/27/15 13:30	TA
2	[signature]	3/27/15 15:00	TA	[signature]	3-28-15 9:30	TAP
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

4/1/2015

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42506-1

Login Number: 42506

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42506-1

Login Number: 42506

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 4/29/15

TestAmerica Job ID: 180-42552-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
4/3/2015 8:42:07 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Job ID: 180-42552-1

Laboratory: TestAmerica Pittsburgh

Narrative

Receipt
The sample was received on 3/31/2015 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.1º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 137097. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Client Sample ID: OC-FRAC 4-032815

Lab Sample ID: 180-42552-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.36	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Diethyl phthalate	0.25	J	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	130		1.0	0.20	mg/L	1		300.0	Total/NA
Nickel	1.1	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	12	J B	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Client Sample ID: OC-FRAC 4-032815
Date Collected: 03/28/15 12:00
Date Received: 03/31/15 09:10

Lab Sample ID: 180-42552-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		03/31/15 11:37	04/01/15 14:33	1
Butyl benzyl phthalate	**0.36**	**J**	0.94	0.13	ug/L		03/31/15 11:37	04/01/15 14:33	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		03/31/15 11:37	04/01/15 14:33	1
Diethyl phthalate	**0.25**	**J**	0.94	0.14	ug/L		03/31/15 11:37	04/01/15 14:33	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		03/31/15 11:37	04/01/15 14:33	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		03/31/15 11:37	04/01/15 14:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*63*		*28 - 107*	*03/31/15 11:37*	*04/01/15 14:33*	*1*
2-Fluorobiphenyl	*64*		*31 - 100*	*03/31/15 11:37*	*04/01/15 14:33*	*1*
2-Fluorophenol (Surr)	*52*		*20 - 100*	*03/31/15 11:37*	*04/01/15 14:33*	*1*
Nitrobenzene-d5 (Surr)	*58*		*33 - 100*	*03/31/15 11:37*	*04/01/15 14:33*	*1*
Phenol-d5 (Surr)	*58*		*26 - 100*	*03/31/15 11:37*	*04/01/15 14:33*	*1*
Terphenyl-d14	*69*		*20 - 109*	*03/31/15 11:37*	*04/01/15 14:33*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		1.0	0.20	mg/L			03/31/15 14:46	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		04/01/15 08:19	04/02/15 10:43	1
Iron	ND		100	9.5	ug/L		04/01/15 08:19	04/02/15 10:43	1
Nickel	**1.1**	**J**	40	0.51	ug/L		04/01/15 08:19	04/02/15 10:43	1
Zinc	**12**	**J B**	20	1.0	ug/L		04/01/15 08:19	04/02/15 10:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		04/02/15 08:25	04/02/15 14:14	1
Total Suspended Solids	ND		5.0	1.6	mg/L			03/31/15 11:50	1
Chlorine, Total Residual	ND	HF	0.20	0.20	mg/L			03/31/15 10:31	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)		
180-42552-1	OC-FRAC 4-032815	63	64	52	58	58	69		
LCS 180-137097/2-A	Lab Control Sample	67	63	62	62	62	63		
LCSD 180-137097/3-A	Lab Control Sample Dup	68	63	63	64	64	64		
MB 180-137097/1-A	Method Blank	59	59	59	59	61	63		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-137097/1-A
Matrix: Water
Analysis Batch: 137173

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 137097

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		03/31/15 11:37	04/01/15 11:50	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		03/31/15 11:37	04/01/15 11:50	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		03/31/15 11:37	04/01/15 11:50	1
Diethyl phthalate	ND		1.0	0.15	ug/L		03/31/15 11:37	04/01/15 11:50	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		03/31/15 11:37	04/01/15 11:50	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		03/31/15 11:37	04/01/15 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*28 - 107*	*03/31/15 11:37*	*04/01/15 11:50*	*1*
2-Fluorobiphenyl	*59*		*31 - 100*	*03/31/15 11:37*	*04/01/15 11:50*	*1*
2-Fluorophenol (Surr)	*59*		*20 - 100*	*03/31/15 11:37*	*04/01/15 11:50*	*1*
Nitrobenzene-d5 (Surr)	*59*		*33 - 100*	*03/31/15 11:37*	*04/01/15 11:50*	*1*
Phenol-d5 (Surr)	*61*		*26 - 100*	*03/31/15 11:37*	*04/01/15 11:50*	*1*
Terphenyl-d14	*63*		*20 - 109*	*03/31/15 11:37*	*04/01/15 11:50*	*1*

Lab Sample ID: LCS 180-137097/2-A
Matrix: Water
Analysis Batch: 137173

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 137097

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			20.0	13.9		ug/L		69	24 - 129		
Butyl benzyl phthalate			20.0	13.8		ug/L		69	38 - 110		
Di-n-butyl phthalate			20.0	13.3		ug/L		66	42 - 106		
Diethyl phthalate			20.0	12.9		ug/L		65	40 - 106		
Dimethyl phthalate			20.0	12.6		ug/L		63	43 - 100		
Di-n-octyl phthalate			20.0	13.8		ug/L		69	31 - 111		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*28 - 107*
2-Fluorobiphenyl	*63*		*31 - 100*
2-Fluorophenol (Surr)	*62*		*20 - 100*
Nitrobenzene-d5 (Surr)	*62*		*33 - 100*
Phenol-d5 (Surr)	*62*		*26 - 100*
Terphenyl-d14	*63*		*20 - 109*

Lab Sample ID: LCSD 180-137097/3-A
Matrix: Water
Analysis Batch: 137173

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 137097

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	14.3		ug/L		71	24 - 129	3	32
Butyl benzyl phthalate			20.0	13.7		ug/L		69	38 - 110	0	18
Di-n-butyl phthalate			20.0	13.6		ug/L		68	42 - 106	3	18
Diethyl phthalate			20.0	12.9		ug/L		65	40 - 106	0	17
Dimethyl phthalate			20.0	12.8		ug/L		64	43 - 100	1	18
Di-n-octyl phthalate			20.0	14.0		ug/L		70	31 - 111	1	25

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-137097/3-A
Matrix: Water
Analysis Batch: 137173

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 137097

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*28 - 107*
2-Fluorobiphenyl	*63*		*31 - 100*
2-Fluorophenol (Surr)	*63*		*20 - 100*
Nitrobenzene-d5 (Surr)	*64*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*64*		*20 - 109*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-137111/6
Matrix: Water
Analysis Batch: 137111

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			03/31/15 11:22	1

Lab Sample ID: LCS 180-137111/5
Matrix: Water
Analysis Batch: 137111

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.7		mg/L		103	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-137180/1-A
Matrix: Water
Analysis Batch: 137378

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 137180

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		04/01/15 08:19	04/02/15 10:33	1
Iron	ND		100	9.5	ug/L		04/01/15 08:19	04/02/15 10:33	1
Nickel	ND		40	0.51	ug/L		04/01/15 08:19	04/02/15 10:33	1
Zinc	1.86	J	20	1.0	ug/L		04/01/15 08:19	04/02/15 10:33	1

Lab Sample ID: LCS 180-137180/2-A
Matrix: Water
Analysis Batch: 137378

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 137180

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	528		ug/L		106	85 - 115
Iron	1000	1010		ug/L		101	85 - 115
Nickel	500	497		ug/L		99	85 - 115
Zinc	500	501		ug/L		100	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 180-42552-1 MS — **Client Sample ID: OC-FRAC 4-032815**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 137378 — **Prep Batch: 137180**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	519		ug/L		104	70 - 130
Iron	ND		1000	984		ug/L		98	70 - 130
Nickel	1.1	J	500	489		ug/L		98	70 - 130
Zinc	12	J B	500	491		ug/L		96	70 - 130

Lab Sample ID: 180-42552-1 MSD — **Client Sample ID: OC-FRAC 4-032815**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 137378 — **Prep Batch: 137180**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	529		ug/L		106	70 - 130	2	20
Iron	ND		1000	1010		ug/L		101	70 - 130	2	20
Nickel	1.1	J	500	502		ug/L		100	70 - 130	3	20
Zinc	12	J B	500	504		ug/L		98	70 - 130	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-282176/9-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 282256 — **Prep Batch: 282176**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		04/02/15 08:25	04/02/15 14:09	1

Lab Sample ID: LCS 500-282176/10-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 282256 — **Prep Batch: 282176**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.104		mg/L		104	90 - 110

Lab Sample ID: 180-42552-1 MS — **Client Sample ID: OC-FRAC 4-032815**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 282256 — **Prep Batch: 282176**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	ND		0.200	0.215		mg/L		107	75 - 125

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-281887/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 281887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			03/31/15 11:45	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 500-281887/2
Matrix: Water
Analysis Batch: 281887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	186		mg/L		93	80 - 120

Method: SM 4500 Cl F - Chlorine, Residual

Lab Sample ID: MB 500-281891/1
Matrix: Water
Analysis Batch: 281891

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.20	0.20	mg/L			03/31/15 10:30	1

Lab Sample ID: 180-42552-1 DU
Matrix: Water
Analysis Batch: 281891

Client Sample ID: OC-FRAC 4-032815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 137097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	3520C	
LCS 180-137097/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-137097/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-137097/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 137173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	8270C LL	137097
LCS 180-137097/2-A	Lab Control Sample	Total/NA	Water	8270C LL	137097
LCSD 180-137097/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	137097
MB 180-137097/1-A	Method Blank	Total/NA	Water	8270C LL	137097

HPLC/IC

Analysis Batch: 137111

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	300.0	
LCS 180-137111/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-137111/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 137180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total Recoverable	Water	200.7	
180-42552-1 MS	OC-FRAC 4-032815	Total Recoverable	Water	200.7	
180-42552-1 MSD	OC-FRAC 4-032815	Total Recoverable	Water	200.7	
LCS 180-137180/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-137180/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 137378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total Recoverable	Water	200.7 Rev 4.4	137180
180-42552-1 MS	OC-FRAC 4-032815	Total Recoverable	Water	200.7 Rev 4.4	137180
180-42552-1 MSD	OC-FRAC 4-032815	Total Recoverable	Water	200.7 Rev 4.4	137180
LCS 180-137180/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	137180
MB 180-137180/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	137180

General Chemistry

Analysis Batch: 281887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	SM 2540D	
LCS 500-281887/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-281887/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 281891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	SM 4500 Cl F	
180-42552-1 DU	OC-FRAC 4-032815	Total/NA	Water	SM 4500 Cl F	

General Chemistry (Continued)

Analysis Batch: 281891 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-281891/1	Method Blank	Total/NA	Water	SM 4500 Cl F	

Prep Batch: 282176

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	Distill/Phenol	
180-42552-1 MS	OC-FRAC 4-032815	Total/NA	Water	Distill/Phenol	
LCS 500-282176/10-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-282176/9-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 282256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-42552-1	OC-FRAC 4-032815	Total/NA	Water	420.4	282176
180-42552-1 MS	OC-FRAC 4-032815	Total/NA	Water	420.4	282176
LCS 500-282176/10-A	Lab Control Sample	Total/NA	Water	420.4	282176
MB 500-282176/9-A	Method Blank	Total/NA	Water	420.4	282176

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Client Sample ID: OC-FRAC 4-032815
Date Collected: 03/28/15 12:00
Date Received: 03/31/15 09:10

Lab Sample ID: 180-42552-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1060 mL	1.0 mL	137097	03/31/15 11:37	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	1060 mL	1.0 mL	137173	04/01/15 14:33	VVP	TAL PIT
	Instrument ID: CH732									
Total/NA	Analysis	300.0		1	1 mL		137111	03/31/15 14:46	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	200.7			50 mL	50 mL	137180	04/01/15 08:19	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	50 mL	50 mL	137378	04/02/15 10:43	RJR	TAL PIT
	Instrument ID: C									
Total/NA	Prep	Distill/Phenol			100 mL	100 mL	282176	04/02/15 08:25	AJR	TAL CHI
Total/NA	Analysis	420.4		1	100 mL	100 mL	282256	04/02/15 14:14	AJR	TAL CHI
	Instrument ID: SEAL2									
Total/NA	Analysis	SM 2540D		1	200 mL	200 mL	281887		SMO	TAL CHI
	Instrument ID: NOEQUIP						(Start)	03/31/15 11:50		
							(End)	03/31/15 11:52		
Total/NA	Analysis	SM 4500 Cl F		1			281891	03/31/15 10:31	LAJ	TAL CHI
	Instrument ID: NOEQUIP									

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL CHI

Batch Type: Prep

AJR = Andrew Raebig

Batch Type: Analysis

AJR = Andrew Raebig

LAJ = Lara Jones

SMO = Syreeta Oliver

Lab: TAL PIT

Batch Type: Prep

AB1 = Ashwin Baikadi

BJT = Bill Trout

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

VVP = Vincent Piccolino

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15 *
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	04-30-15 *
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15 *
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15 *
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15 *
South Carolina	State Program	4	89014	04-30-15 *
Texas	NELAP	6	T104704528	03-31-16
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P-Soil-01	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15 *
California	State Program	9	2903	04-30-15 *
Georgia	State Program	4	N/A	04-30-15 *
Georgia	State Program	4	939	04-30-15 *
Hawaii	State Program	9	N/A	04-30-15 *
Illinois	NELAP	5	100201	04-30-15 *
Indiana	State Program	5	C-IL-02	04-30-15 *
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	04-30-15 *
Kentucky (UST)	State Program	4	66	04-30-15 *
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15 *
New York	NELAP	2	IL00035	04-01-16
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15 *
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15 *
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Laboratory: TestAmerica Chicago (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wyoming	State Program	8	8TMS-Q	04-30-15 *

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 4500 Cl F	Chlorine, Residual	SM	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 180-42552-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-42552-1	OC-FRAC 4-032815	Water	03/28/15 12:00	03/31/15 09:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody R

180-42552 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com	Page: Page 1 of 1
Company: Olin Corporation			Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978-658-6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG	Project #: 48006853		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 4- 032815	3-28-15	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 3-30-15 [illegible]	Company	Received by:	Date/Time: 3-30-15 1300	Company
Relinquished by:	Date/Time: 3-30-15 1700	Company	Received by:	Date/Time: 5-31-15 9:10	Company
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42552-1

Login Number: 42552

List Number: 1

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 180-42552-1

Login Number: 42552

List Number: 2

Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-75432-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
2/20/2015 12:33:34 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Job ID: 480-75432-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The samples were received on 2/13/2015 3:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
Method 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: OC-ANN. RGP INFLUENT (480-75432-1). Elevated reporting limits (RLs) are provided.

Method 8260C: The continuing calibration verification (CCV) for 1,4-Dioxane associated with batch 227080 recovered above the MCP upper control limit. MCP protocol allows for 20% of the target compounds to be outside the 20% difference but not over 40% difference. (CCVIS 480-227080/9)

Method8260C: The laboratory control sample (LCS) and the laboratory control sample duplicate (LCSD) for batch 227080 exceeded control limits for the following analyte: 2,4,4-Trimethyl-2-pentene. MCP protocol allows for 10% of the target compounds to be outside of the limits provided the recoveries are over 10%. (LCS 480-227080/6), (LCSD 480-227080/5)

Method 8260C: The following volatile sample was analyzed with significant headspace in the sample vial: OC-TB (480-75432-2). Significant headspace is defined as a bubble greater than 6 mm in diameter.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method 1664A: The method blank (MB) and laboratory control standard (LCS) analyzed in batch 275941 were in control, but were analyzed as HEM, rather than SGT-HEM, since the sample was a non-detect for HEM and did not require the silica gel treatment. The MB, at 0.90 mg/L, was less than the RL of 5 mg/L, and the LCS and recovery was 90% and was within the 78 -114% limit. The true value for the LCS is 40 mg/L and 36.0 mg/L was recovered for the LCS.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 133518. 8270_LL

Method 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 133517.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Client Sample ID: OC-ANN. RGP INFLUENT — Lab Sample ID: 480-75432-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	270		4.0	1.6	ug/L	4		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	79	*	4.0	1.7	ug/L	4		8260C	Total/NA
Bis(2-ethylhexyl) phthalate	6.1		1.9	1.2	ug/L	1		8270C LL	Total/NA
Butyl benzyl phthalate	0.24	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	130		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	9.6	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	6700		100	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Lead	1.9	J	10	1.2	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	2.1	J	40	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	8.3	J	20	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Total Petroleum Hydrocarbons (1664A)	1.3	J	4.7	0.46	mg/L	1		1664A	Total/NA
Cyanide, Total	0.0041	J B	0.010	0.0025	mg/L	1		335.4	Total/NA
Phenolics, Total Recoverable	0.0079		0.0050	0.0022	mg/L	1		420.4	Total/NA

Client Sample ID: OC-TB — Lab Sample ID: 480-75432-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methylene Chloride	0.60	J	1.0	0.44	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Client Sample ID: OC-ANN. RGP INFLUENT
Date Collected: 02/12/15 09:30
Date Received: 02/13/15 03:00

Lab Sample ID: 480-75432-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.0	3.3	ug/L			02/17/15 19:21	4
1,1,2-Trichloroethane	ND		4.0	0.92	ug/L			02/17/15 19:21	4
1,1-Dichloroethane	ND		4.0	1.5	ug/L			02/17/15 19:21	4
1,1-Dichloroethene	ND		4.0	1.2	ug/L			02/17/15 19:21	4
1,2-Dichlorobenzene	ND		4.0	3.2	ug/L			02/17/15 19:21	4
1,2-Dichloroethane	ND		4.0	0.84	ug/L			02/17/15 19:21	4
1,3-Dichlorobenzene	ND		4.0	3.1	ug/L			02/17/15 19:21	4
1,4-Dichlorobenzene	ND		4.0	3.4	ug/L			02/17/15 19:21	4
1,4-Dioxane	ND		200	37	ug/L			02/17/15 19:21	4
2,4,4-Trimethyl-1-pentene	**270**		4.0	1.6	ug/L			02/17/15 19:21	4
2,4,4-Trimethyl-2-pentene	**79**	*	4.0	1.7	ug/L			02/17/15 19:21	4
Butyl alcohol, tert-	ND		200	56	ug/L			02/17/15 19:21	4
Acetone	ND		200	12	ug/L			02/17/15 19:21	4
Benzene	ND		4.0	1.6	ug/L			02/17/15 19:21	4
Carbon tetrachloride	ND		4.0	1.1	ug/L			02/17/15 19:21	4
cis-1,2-Dichloroethene	ND		4.0	3.2	ug/L			02/17/15 19:21	4
Ethylbenzene	ND		4.0	3.0	ug/L			02/17/15 19:21	4
Methyl tert-butyl ether	ND		4.0	0.64	ug/L			02/17/15 19:21	4
Methylene Chloride	ND		4.0	1.8	ug/L			02/17/15 19:21	4
m-Xylene & p-Xylene	ND		8.0	2.6	ug/L			02/17/15 19:21	4
Naphthalene	ND		20	1.7	ug/L			02/17/15 19:21	4
o-Xylene	ND		4.0	3.0	ug/L			02/17/15 19:21	4
Tert-amyl methyl ether	ND		20	1.1	ug/L			02/17/15 19:21	4
Tetrachloroethene	ND		4.0	1.4	ug/L			02/17/15 19:21	4
Toluene	ND		4.0	2.0	ug/L			02/17/15 19:21	4
Trichloroethene	ND		4.0	1.8	ug/L			02/17/15 19:21	4
Vinyl chloride	ND		4.0	3.6	ug/L			02/17/15 19:21	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*02/17/15 19:21*	*4*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*02/17/15 19:21*	*4*
Toluene-d8 (Surr)	*92*		*70 - 130*		*02/17/15 19:21*	*4*

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**6.1**		1.9	1.2	ug/L		02/13/15 13:25	02/17/15 13:20	1
Butyl benzyl phthalate	**0.24**	J	0.94	0.13	ug/L		02/13/15 13:25	02/17/15 13:20	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		02/13/15 13:25	02/17/15 13:20	1
Diethyl phthalate	ND		0.94	0.14	ug/L		02/13/15 13:25	02/17/15 13:20	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		02/13/15 13:25	02/17/15 13:20	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		02/13/15 13:25	02/17/15 13:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*63*		*28 - 107*	*02/13/15 13:25*	*02/17/15 13:20*	*1*
2-Fluorobiphenyl	*56*		*31 - 100*	*02/13/15 13:25*	*02/17/15 13:20*	*1*
2-Fluorophenol (Surr)	*49*		*20 - 100*	*02/13/15 13:25*	*02/17/15 13:20*	*1*
Nitrobenzene-d5 (Surr)	*53*		*33 - 100*	*02/13/15 13:25*	*02/17/15 13:20*	*1*
Phenol-d5 (Surr)	*57*		*26 - 100*	*02/13/15 13:25*	*02/17/15 13:20*	*1*
Terphenyl-d14	*52*		*20 - 109*	*02/13/15 13:25*	*02/17/15 13:20*	*1*

Client Sample ID: OC-ANN. RGP INFLUENT

Lab Sample ID: 480-75432-1

Date Collected: 02/12/15 09:30

Matrix: Water

Date Received: 02/13/15 03:00

Method: 608 - Polychlorinated Biphenyls (PCBs) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1221	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1232	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1242	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1248	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1254	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1
PCB-1260	ND		0.0094	0.0028	ug/L		02/13/15 12:55	02/17/15 20:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*74*		*36 - 129*	*02/13/15 12:55*	*02/17/15 20:49*	*1*
DCB Decachlorobiphenyl (Surr)	*119*		*57 - 144*	*02/13/15 12:55*	*02/17/15 20:49*	*1*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	ND		0.020	0.0012	ug/L		02/14/15 14:47	02/15/15 05:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1,2-Tetrachloroethane	*86*		*60 - 140*	*02/14/15 14:47*	*02/15/15 05:22*	*1*
1,1,1,2-Tetrachloroethane	*85*		*60 - 140*	*02/14/15 14:47*	*02/15/15 05:22*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		5.0	0.98	mg/L			02/19/15 14:59	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	1.6	ug/L		02/17/15 08:53	02/18/15 19:58	1
Arsenic	**9.6**	**J**	10	3.0	ug/L		02/17/15 08:53	02/18/15 19:58	1
Cadmium	ND		5.0	0.13	ug/L		02/17/15 08:53	02/18/15 19:58	1
Chromium	ND		5.0	0.77	ug/L		02/17/15 08:53	02/18/15 19:58	1
Copper	ND		25	1.5	ug/L		02/17/15 08:53	02/18/15 19:58	1
Iron	**6700**		100	9.5	ug/L		02/17/15 08:53	02/18/15 19:58	1
Lead	**1.9**	**J**	10	1.2	ug/L		02/17/15 08:53	02/18/15 19:58	1
Nickel	**2.1**	**J**	40	0.51	ug/L		02/17/15 08:53	02/18/15 19:58	1
Selenium	ND		10	3.9	ug/L		02/17/15 08:53	02/18/15 19:58	1
Silver	ND		5.0	0.73	ug/L		02/17/15 08:53	02/18/15 19:58	1
Zinc	**8.3**	**J**	20	1.0	ug/L		02/17/15 08:53	02/18/15 19:58	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.031	ug/L		02/18/15 11:34	02/19/15 09:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Petroleum Hydrocarbons (1664A)	**1.3**	**J**	4.7	0.46	mg/L		02/15/15 20:42	02/15/15 22:11	1
Cyanide, Total	**0.0041**	**J B**	0.010	0.0025	mg/L		02/18/15 09:10	02/18/15 13:32	1
Phenolics, Total Recoverable	**0.0079**		0.0050	0.0022	mg/L		02/17/15 14:55	02/17/15 16:15	1
Total Suspended Solids	ND		5.0	1.6	mg/L			02/13/15 15:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			02/13/15 09:16	1

Client Sample ID: OC-ANN. RGP INFLUENT

Lab Sample ID: 480-75432-1

Date Collected: 02/12/15 09:30

Matrix: Water

Date Received: 02/13/15 03:00

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, trivalent	ND		0.010	0.010	mg/L			02/19/15 08:09	1

Client Sample ID: OC-TB

Lab Sample ID: 480-75432-2

Date Collected: 02/12/15 00:00

Matrix: Water

Date Received: 02/13/15 03:00

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/17/15 19:49	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/17/15 19:49	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/17/15 19:49	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/17/15 19:49	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/17/15 19:49	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/17/15 19:49	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/17/15 19:49	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/17/15 19:49	1
1,4-Dioxane	ND		50	9.3	ug/L			02/17/15 19:49	1
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			02/17/15 19:49	1
2,4,4-Trimethyl-2-pentene	ND	*	1.0	0.43	ug/L			02/17/15 19:49	1
Butyl alcohol, tert-	ND		50	14	ug/L			02/17/15 19:49	1
Acetone	ND		50	3.0	ug/L			02/17/15 19:49	1
Benzene	ND		1.0	0.41	ug/L			02/17/15 19:49	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/17/15 19:49	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/17/15 19:49	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/17/15 19:49	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/17/15 19:49	1
Methylene Chloride	**0.60**	**J**	1.0	0.44	ug/L			02/17/15 19:49	1
m-Xylene & p-Xylene	ND		2.0	0.66	ug/L			02/17/15 19:49	1
Naphthalene	ND		5.0	0.43	ug/L			02/17/15 19:49	1
o-Xylene	ND		1.0	0.76	ug/L			02/17/15 19:49	1
Tert-amyl methyl ether	ND		5.0	0.27	ug/L			02/17/15 19:49	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/17/15 19:49	1
Toluene	ND		1.0	0.51	ug/L			02/17/15 19:49	1
Trichloroethene	ND		1.0	0.46	ug/L			02/17/15 19:49	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/17/15 19:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*02/17/15 19:49*	*1*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*02/17/15 19:49*	*1*
Toluene-d8 (Surr)	*93*		*70 - 130*		*02/17/15 19:49*	*1*

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		12DCE	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
480-75432-1	OC-ANN. RGP INFLUENT	98	102	92
480-75432-2	OC-TB	101	99	93
LCS 480-227080/6	Lab Control Sample	108	104	92
LCSD 480-227080/5	Lab Control Sample Dup	111	104	94
MB 480-227080/8	Method Blank	99	103	97

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(28-107)	(31-100)	(20-100)	(33-100)	(26-100)	(20-109)
480-75432-1	OC-ANN. RGP INFLUENT	63	56	49	53	57	52
LCS 180-133518/2-A	Lab Control Sample	60	58	62	58	64	54
LCSD 180-133518/3-A	Lab Control Sample Dup	63	59	63	59	66	57
MB 180-133518/1-A	Method Blank	61	59	64	60	69	61

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 608 - Polychlorinated Biphenyls (PCBs) (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX2	DCB2
Lab Sample ID	Client Sample ID	(36-129)	(57-144)
480-75432-1	OC-ANN. RGP INFLUENT	74	119
LCS 180-133517/4-A	Lab Control Sample	93	102
LCSD 180-133517/5-A	Lab Control Sample Dup	94	104
MB 180-133517/1-A	Method Blank	89	100

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCB = DCB Decachlorobiphenyl (Surr)

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	TCEA1 (60-140)	TCEA2 (60-140)								
480-75432-1	OC-ANN. RGP INFLUENT	86	85								
480-75432-1 MS	OC-ANN. RGP INFLUENT	92	90								
480-75432-1 MSD	OC-ANN. RGP INFLUENT	97	95								
LCS 180-133540/9-A	Lab Control Sample	94	91								
MB 180-133540/8-A	Method Blank	97	94								

Surrogate Legend

TCEA = 1,1,1,2-Tetrachloroethane

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 480-227080/8
Matrix: Water
Analysis Batch: 227080

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/17/15 13:42	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/17/15 13:42	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/17/15 13:42	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/17/15 13:42	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/17/15 13:42	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/17/15 13:42	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/17/15 13:42	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/17/15 13:42	1
1,4-Dioxane	ND		50	9.3	ug/L			02/17/15 13:42	1
2,4,4-Trimethyl-1-pentene	ND		1.0	0.40	ug/L			02/17/15 13:42	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.43	ug/L			02/17/15 13:42	1
Butyl alcohol, tert-	ND		50	14	ug/L			02/17/15 13:42	1
Acetone	ND		50	3.0	ug/L			02/17/15 13:42	1
Benzene	ND		1.0	0.41	ug/L			02/17/15 13:42	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/17/15 13:42	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/17/15 13:42	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/17/15 13:42	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/17/15 13:42	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/17/15 13:42	1
m-Xylene & p-Xylene	ND		2.0	0.66	ug/L			02/17/15 13:42	1
Naphthalene	ND		5.0	0.43	ug/L			02/17/15 13:42	1
o-Xylene	ND		1.0	0.76	ug/L			02/17/15 13:42	1
Tert-amyl methyl ether	ND		5.0	0.27	ug/L			02/17/15 13:42	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/17/15 13:42	1
Toluene	ND		1.0	0.51	ug/L			02/17/15 13:42	1
Trichloroethene	ND		1.0	0.46	ug/L			02/17/15 13:42	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/17/15 13:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*02/17/15 13:42*	*1*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*		*02/17/15 13:42*	*1*
Toluene-d8 (Surr)	*97*		*70 - 130*		*02/17/15 13:42*	*1*

Lab Sample ID: LCS 480-227080/6
Matrix: Water
Analysis Batch: 227080

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	25.0	27.7		ug/L		111	70 - 130
1,1,2-Trichloroethane	25.0	23.2		ug/L		93	70 - 130
1,1-Dichloroethane	25.0	26.8		ug/L		107	70 - 130
1,1-Dichloroethene	25.0	26.1		ug/L		105	70 - 130
1,2-Dichlorobenzene	25.0	24.7		ug/L		99	70 - 130
1,2-Dichloroethane	25.0	27.3		ug/L		109	70 - 130
1,3-Dichlorobenzene	25.0	24.9		ug/L		100	70 - 130
1,4-Dichlorobenzene	25.0	24.1		ug/L		96	70 - 130
1,4-Dioxane	500	582		ug/L		116	70 - 130
2,4,4-Trimethyl-1-pentene	25.0	24.3		ug/L		97	70 - 130

Method: 8260C - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 480-227080/6
Matrix: Water
Analysis Batch: 227080

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,4-Trimethyl-2-pentene	25.0	32.9	*	ug/L		132	70 - 130
Butyl alcohol, tert-	250	276		ug/L		111	70 - 130
Acetone	125	116		ug/L		93	70 - 130
Benzene	25.0	25.4		ug/L		101	70 - 130
Carbon tetrachloride	25.0	28.5		ug/L		114	70 - 130
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	70 - 130
Ethylbenzene	25.0	25.2		ug/L		101	70 - 130
Methyl tert-butyl ether	25.0	26.8		ug/L		107	70 - 130
Methylene Chloride	25.0	26.3		ug/L		105	70 - 130
m-Xylene & p-Xylene	25.0	25.8		ug/L		103	70 - 130
Naphthalene	25.0	25.1		ug/L		100	70 - 130
o-Xylene	25.0	25.8		ug/L		103	70 - 130
Tert-amyl methyl ether	25.0	24.4		ug/L		98	70 - 130
Tetrachloroethene	25.0	27.0		ug/L		108	70 - 130
Toluene	25.0	24.5		ug/L		98	70 - 130
Trichloroethene	25.0	27.2		ug/L		109	70 - 130
Vinyl chloride	25.0	30.6		ug/L		122	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*92*		*70 - 130*

Lab Sample ID: LCSD 480-227080/5
Matrix: Water
Analysis Batch: 227080

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	25.0	28.9		ug/L		115	70 - 130	4	20
1,1,2-Trichloroethane	25.0	23.9		ug/L		96	70 - 130	3	20
1,1-Dichloroethane	25.0	27.5		ug/L		110	70 - 130	3	20
1,1-Dichloroethene	25.0	27.3		ug/L		109	70 - 130	4	20
1,2-Dichlorobenzene	25.0	25.1		ug/L		100	70 - 130	2	20
1,2-Dichloroethane	25.0	27.3		ug/L		109	70 - 130	0	20
1,3-Dichlorobenzene	25.0	25.5		ug/L		102	70 - 130	2	20
1,4-Dichlorobenzene	25.0	25.0		ug/L		100	70 - 130	4	20
1,4-Dioxane	500	587		ug/L		117	70 - 130	1	20
2,4,4-Trimethyl-1-pentene	25.0	25.8		ug/L		103	70 - 130	6	20
2,4,4-Trimethyl-2-pentene	25.0	33.8	*	ug/L		135	70 - 130	3	20
Butyl alcohol, tert-	250	285		ug/L		114	70 - 130	3	20
Acetone	125	123		ug/L		98	70 - 130	6	20
Benzene	25.0	26.1		ug/L		104	70 - 130	3	20
Carbon tetrachloride	25.0	29.0		ug/L		116	70 - 130	2	20
cis-1,2-Dichloroethene	25.0	27.4		ug/L		110	70 - 130	5	20
Ethylbenzene	25.0	25.8		ug/L		103	70 - 130	3	20
Methyl tert-butyl ether	25.0	27.4		ug/L		110	70 - 130	2	20
Methylene Chloride	25.0	27.4		ug/L		110	70 - 130	4	20
m-Xylene & p-Xylene	25.0	25.5		ug/L		102	70 - 130	1	20

Method: 8260C - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 480-227080/5
Matrix: Water
Analysis Batch: 227080

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene			25.0	25.7		ug/L		103	70 - 130	3	20
o-Xylene			25.0	25.8		ug/L		103	70 - 130	0	20
Tert-amyl methyl ether			25.0	24.6		ug/L		98	70 - 130	1	20
Tetrachloroethene			25.0	27.9		ug/L		112	70 - 130	3	20
Toluene			25.0	25.2		ug/L		101	70 - 130	3	20
Trichloroethene			25.0	27.9		ug/L		112	70 - 130	3	20
Vinyl chloride			25.0	31.8		ug/L		127	70 - 130	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*94*		*70 - 130*

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-133518/1-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		02/13/15 13:25	02/17/15 11:31	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		02/13/15 13:25	02/17/15 11:31	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		02/13/15 13:25	02/17/15 11:31	1
Diethyl phthalate	ND		1.0	0.15	ug/L		02/13/15 13:25	02/17/15 11:31	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		02/13/15 13:25	02/17/15 11:31	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		02/13/15 13:25	02/17/15 11:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*28 - 107*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
2-Fluorobiphenyl	*59*		*31 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
2-Fluorophenol (Surr)	*64*		*20 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Nitrobenzene-d5 (Surr)	*60*		*33 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Phenol-d5 (Surr)	*69*		*26 - 100*	*02/13/15 13:25*	*02/17/15 11:31*	*1*
Terphenyl-d14	*61*		*20 - 109*	*02/13/15 13:25*	*02/17/15 11:31*	*1*

Lab Sample ID: LCS 180-133518/2-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133518

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate			20.0	12.0		ug/L		60	24 - 129
Butyl benzyl phthalate			20.0	11.6		ug/L		58	38 - 110
Di-n-butyl phthalate			20.0	11.5		ug/L		58	42 - 106
Diethyl phthalate			20.0	11.4		ug/L		57	40 - 106
Dimethyl phthalate			20.0	11.7		ug/L		58	43 - 100
Di-n-octyl phthalate			20.0	12.9		ug/L		64	31 - 111

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCS 180-133518/2-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133518

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*60*		*28 - 107*
2-Fluorobiphenyl	*58*		*31 - 100*
2-Fluorophenol (Surr)	*62*		*20 - 100*
Nitrobenzene-d5 (Surr)	*58*		*33 - 100*
Phenol-d5 (Surr)	*64*		*26 - 100*
Terphenyl-d14	*54*		*20 - 109*

Lab Sample ID: LCSD 180-133518/3-A
Matrix: Water
Analysis Batch: 133593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133518

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			20.0	12.7		ug/L		63	24 - 129	5	32
Butyl benzyl phthalate			20.0	12.4		ug/L		62	38 - 110	7	18
Di-n-butyl phthalate			20.0	11.8		ug/L		59	42 - 106	3	18
Diethyl phthalate			20.0	11.5		ug/L		58	40 - 106	1	17
Dimethyl phthalate			20.0	11.6		ug/L		58	43 - 100	1	18
Di-n-octyl phthalate			20.0	13.2		ug/L		66	31 - 111	2	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*63*		*28 - 107*
2-Fluorobiphenyl	*59*		*31 - 100*
2-Fluorophenol (Surr)	*63*		*20 - 100*
Nitrobenzene-d5 (Surr)	*59*		*33 - 100*
Phenol-d5 (Surr)	*66*		*26 - 100*
Terphenyl-d14	*57*		*20 - 109*

Method: 608 - Polychlorinated Biphenyls (PCBs) (GC)

Lab Sample ID: MB 180-133517/1-A
Matrix: Water
Analysis Batch: 133574

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133517

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1221	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1232	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1242	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1248	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1254	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1
PCB-1260	ND		0.010	0.0029	ug/L		02/13/15 12:55	02/17/15 19:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*89*		*36 - 129*	*02/13/15 12:55*	*02/17/15 19:54*	*1*
DCB Decachlorobiphenyl (Surr)	*100*		*57 - 144*	*02/13/15 12:55*	*02/17/15 19:54*	*1*

Method: 608 - Polychlorinated Biphenyls (PCBs) (GC) (Continued)

Lab Sample ID: LCS 180-133517/4-A
Matrix: Water
Analysis Batch: 133574

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133517

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PCB-1016			1.00	0.833		ug/L		83	50 - 114		
PCB-1260			1.00	0.780		ug/L		78	10 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*93*		*36 - 129*
DCB Decachlorobiphenyl (Surr)	*102*		*57 - 144*

Lab Sample ID: LCSD 180-133517/5-A
Matrix: Water
Analysis Batch: 133574

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 133517

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016			1.00	0.898		ug/L		90	50 - 114	7	20
PCB-1260			1.00	0.840		ug/L		84	10 - 127	7	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*94*		*36 - 129*
DCB Decachlorobiphenyl (Surr)	*104*		*57 - 144*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC)

Lab Sample ID: MB 180-133540/8-A
Matrix: Water
Analysis Batch: 133541

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133540

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	ND		0.020	0.0012	ug/L		02/14/15 14:47	02/14/15 20:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,1,1,2-Tetrachloroethane	*97*		*60 - 140*	*02/14/15 14:47*	*02/14/15 20:24*	*1*
1,1,1,2-Tetrachloroethane	*94*		*60 - 140*	*02/14/15 14:47*	*02/14/15 20:24*	*1*

Lab Sample ID: LCS 180-133540/9-A
Matrix: Water
Analysis Batch: 133541

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133540

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ethylene Dibromide			0.100	0.101		ug/L		101	60 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,1,1,2-Tetrachloroethane	*94*		*60 - 140*
1,1,1,2-Tetrachloroethane	*91*		*60 - 140*

Method: 8011 - EDB, DBCP, and 1,2,3-TCP (GC) (Continued)

Lab Sample ID: 480-75432-1 MS
Matrix: Water
Analysis Batch: 133541

Client Sample ID: OC-ANN. RGP INFLUENT
Prep Type: Total/NA
Prep Batch: 133540

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylene Dibromide	ND		0.0992	0.0978		ug/L		99	60 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,1,1,2-Tetrachloroethane	*92*		*60 - 140*
1,1,1,2-Tetrachloroethane	*90*		*60 - 140*

Lab Sample ID: 480-75432-1 MSD
Matrix: Water
Analysis Batch: 133541

Client Sample ID: OC-ANN. RGP INFLUENT
Prep Type: Total/NA
Prep Batch: 133540

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylene Dibromide	ND		0.0997	0.100		ug/L		101	60 - 140	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,1,1,2-Tetrachloroethane	*97*		*60 - 140*
1,1,1,2-Tetrachloroethane	*95*		*60 - 140*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-133835/6
Matrix: Water
Analysis Batch: 133835

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			02/19/15 11:01	1

Lab Sample ID: LCS 180-133835/5
Matrix: Water
Analysis Batch: 133835

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	45.6		mg/L		91	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-133602/1-A
Matrix: Water
Analysis Batch: 133788

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	1.6	ug/L		02/17/15 08:53	02/18/15 19:28	1
Arsenic	ND		10	3.0	ug/L		02/17/15 08:53	02/18/15 19:28	1
Cadmium	ND		5.0	0.13	ug/L		02/17/15 08:53	02/18/15 19:28	1
Chromium	ND		5.0	0.77	ug/L		02/17/15 08:53	02/18/15 19:28	1
Copper	ND		25	1.5	ug/L		02/17/15 08:53	02/18/15 19:28	1
Iron	ND		100	9.5	ug/L		02/17/15 08:53	02/18/15 19:28	1
Lead	ND		10	1.2	ug/L		02/17/15 08:53	02/18/15 19:28	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 180-133602/1-A
Matrix: Water
Analysis Batch: 133788

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		40	0.51	ug/L		02/17/15 08:53	02/18/15 19:28	1
Selenium	ND		10	3.9	ug/L		02/17/15 08:53	02/18/15 19:28	1
Silver	ND		5.0	0.73	ug/L		02/17/15 08:53	02/18/15 19:28	1
Zinc	ND		20	1.0	ug/L		02/17/15 08:53	02/18/15 19:28	1

Lab Sample ID: LCS 180-133602/2-A
Matrix: Water
Analysis Batch: 133788

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 133602

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	500	510		ug/L		102	85 - 115
Arsenic	500	503		ug/L		101	85 - 115
Cadmium	50.0	50.0		ug/L		100	85 - 115
Chromium	200	189		ug/L		95	85 - 115
Copper	250	239		ug/L		96	85 - 115
Iron	1000	942		ug/L		94	85 - 115
Lead	500	495		ug/L		99	85 - 115
Nickel	500	485		ug/L		97	85 - 115
Selenium	500	531		ug/L		106	85 - 115
Silver	50.0	51.3		ug/L		103	85 - 115
Zinc	500	485		ug/L		97	85 - 115

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 180-133748/1-A
Matrix: Water
Analysis Batch: 133837

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133748

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.031	ug/L		02/18/15 11:34	02/19/15 09:25	1

Lab Sample ID: LCS 180-133748/2-A
Matrix: Water
Analysis Batch: 133837

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133748

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.65		ug/L		106	85 - 115

Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 180-133722/4-A
Matrix: Water
Analysis Batch: 133775

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 133722

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.00360	J	0.010	0.0025	mg/L		02/18/15 09:10	02/18/15 12:47	1

Method: 335.4 - Cyanide, Total (Continued)

Lab Sample ID: HLCS 180-133722/2-A
Matrix: Water
Analysis Batch: 133775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133722

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.250	0.245		mg/L		98	90 - 110

Lab Sample ID: LCS 180-133722/3-A
Matrix: Water
Analysis Batch: 133775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133722

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.200	0.196		mg/L		98	90 - 110

Lab Sample ID: LLCS 180-133722/1-A
Matrix: Water
Analysis Batch: 133775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 133722

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.0500	0.0508		mg/L		102	90 - 110

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 500-276106/1-A
Matrix: Water
Analysis Batch: 276126

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 276106

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0050	0.0022	mg/L		02/17/15 14:55	02/17/15 16:06	1

Lab Sample ID: LCS 500-276106/2-A
Matrix: Water
Analysis Batch: 276126

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 276106

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0964		mg/L		96	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 500-275894/1
Matrix: Water
Analysis Batch: 275894

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		5.0	1.6	mg/L			02/13/15 14:50	1

Lab Sample ID: LCS 500-275894/2
Matrix: Water
Analysis Batch: 275894

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	200	186		mg/L		93	80 - 120

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Method: SM 3500 CR D - Chromium, Hexavalent

Lab Sample ID: MB 360-99701/9
Matrix: Water
Analysis Batch: 99701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		0.0050	0.0050	mg/L			02/13/15 09:16	1

Lab Sample ID: LCS 360-99701/10
Matrix: Water
Analysis Batch: 99701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	0.0507	0.0492		mg/L		97	85 - 115

Lab Sample ID: LCSD 360-99701/11
Matrix: Water
Analysis Batch: 99701

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	0.0507	0.0492		mg/L		97	85 - 115	0	20

GC/MS VOA

Analysis Batch: 227080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	8260C	
480-75432-2	OC-TB	Total/NA	Water	8260C	
LCS 480-227080/6	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-227080/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-227080/8	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 133518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	3520C	
LCS 180-133518/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-133518/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-133518/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 133593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	8270C LL	133518
LCS 180-133518/2-A	Lab Control Sample	Total/NA	Water	8270C LL	133518
LCSD 180-133518/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	133518
MB 180-133518/1-A	Method Blank	Total/NA	Water	8270C LL	133518

GC Semi VOA

Prep Batch: 133517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	608	
LCS 180-133517/4-A	Lab Control Sample	Total/NA	Water	608	
LCSD 180-133517/5-A	Lab Control Sample Dup	Total/NA	Water	608	
MB 180-133517/1-A	Method Blank	Total/NA	Water	608	

Prep Batch: 133540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	
480-75432-1 MS	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	
480-75432-1 MSD	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	
LCS 180-133540/9-A	Lab Control Sample	Total/NA	Water	8011	
MB 180-133540/8-A	Method Blank	Total/NA	Water	8011	

Analysis Batch: 133541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	133540
480-75432-1 MS	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	133540
480-75432-1 MSD	OC-ANN. RGP INFLUENT	Total/NA	Water	8011	133540
LCS 180-133540/9-A	Lab Control Sample	Total/NA	Water	8011	133540
MB 180-133540/8-A	Method Blank	Total/NA	Water	8011	133540

Analysis Batch: 133574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	608	133517

GC Semi VOA (Continued)

Analysis Batch: 133574 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-133517/4-A	Lab Control Sample	Total/NA	Water	608	133517
LCSD 180-133517/5-A	Lab Control Sample Dup	Total/NA	Water	608	133517
MB 180-133517/1-A	Method Blank	Total/NA	Water	608	133517

HPLC/IC

Analysis Batch: 133835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	300.0	
LCS 180-133835/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-133835/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 133602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total Recoverable	Water	200.7	
LCS 180-133602/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-133602/1-A	Method Blank	Total Recoverable	Water	200.7	

Prep Batch: 133748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	245.1	
LCS 180-133748/2-A	Lab Control Sample	Total/NA	Water	245.1	
MB 180-133748/1-A	Method Blank	Total/NA	Water	245.1	

Analysis Batch: 133788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total Recoverable	Water	200.7 Rev 4.4	133602
LCS 180-133602/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	133602
MB 180-133602/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	133602

Analysis Batch: 133837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	245.1	133748
LCS 180-133748/2-A	Lab Control Sample	Total/NA	Water	245.1	133748
MB 180-133748/1-A	Method Blank	Total/NA	Water	245.1	133748

General Chemistry

Analysis Batch: 99701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	SM 3500 CR D	
LCS 360-99701/10	Lab Control Sample	Total/NA	Water	SM 3500 CR D	
LCSD 360-99701/11	Lab Control Sample Dup	Total/NA	Water	SM 3500 CR D	
MB 360-99701/9	Method Blank	Total/NA	Water	SM 3500 CR D	

Analysis Batch: 99711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	SM 3500 CR D	

General Chemistry (Continued)

Prep Batch: 133722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	Distill/CN	
HLCS 180-133722/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
LCS 180-133722/3-A	Lab Control Sample	Total/NA	Water	Distill/CN	
LLCS 180-133722/1-A	Lab Control Sample	Total/NA	Water	Distill/CN	
MB 180-133722/4-A	Method Blank	Total/NA	Water	Distill/CN	

Analysis Batch: 133775

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	335.4	133722
HLCS 180-133722/2-A	Lab Control Sample	Total/NA	Water	335.4	133722
LCS 180-133722/3-A	Lab Control Sample	Total/NA	Water	335.4	133722
LLCS 180-133722/1-A	Lab Control Sample	Total/NA	Water	335.4	133722
MB 180-133722/4-A	Method Blank	Total/NA	Water	335.4	133722

Analysis Batch: 275894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	SM 2540D	
LCS 500-275894/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 500-275894/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 275940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	1664A	

Analysis Batch: 275941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	1664A	275940

Prep Batch: 276106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	Distill/Phenol	
LCS 500-276106/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 500-276106/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 276126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-75432-1	OC-ANN. RGP INFLUENT	Total/NA	Water	420.4	276106
LCS 500-276106/2-A	Lab Control Sample	Total/NA	Water	420.4	276106
MB 500-276106/1-A	Method Blank	Total/NA	Water	420.4	276106

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Client Sample ID: OC-ANN. RGP INFLUENT

Lab Sample ID: 480-75432-1

Date Collected: 02/12/15 09:30

Matrix: Water

Date Received: 02/13/15 03:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		4	227080	02/17/15 19:21	NMD1	TAL BUF
Total/NA	Prep	3520C			133518	02/13/15 13:25	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	133593	02/17/15 13:20	VVP	TAL PIT
Total/NA	Prep	608			133517	02/13/15 12:55	CBY	TAL PIT
Total/NA	Analysis	608		1	133574	02/17/15 20:49	JMO	TAL PIT
Total/NA	Prep	8011			133540	02/14/15 14:47	CMR	TAL PIT
Total/NA	Analysis	8011		1	133541	02/15/15 05:22	CMR	TAL PIT
Total/NA	Analysis	300.0		5	133835	02/19/15 14:59	CMR	TAL PIT
Total Recoverable	Prep	200.7			133602	02/17/15 08:53	AB1	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	133788	02/18/15 19:58	RJG	TAL PIT
Total/NA	Prep	245.1			133748	02/18/15 11:34	RJR	TAL PIT
Total/NA	Analysis	245.1		1	133837	02/19/15 09:30	RJR	TAL PIT
Total/NA	Prep	1664A			275940	02/15/15 20:42	SJS	TAL CHI
Total/NA	Analysis	1664A		1	275941	02/15/15 22:11	SJS	TAL CHI
Total/NA	Prep	Distill/CN			133722	02/18/15 09:10	PGJ	TAL PIT
Total/NA	Analysis	335.4		1	133775	02/18/15 13:32	PGJ	TAL PIT
Total/NA	Prep	Distill/Phenol			276106	02/17/15 14:55	AJR	TAL CHI
Total/NA	Analysis	420.4		1	276126	02/17/15 16:15	AJR	TAL CHI
Total/NA	Analysis	SM 2540D		1	275894		SMO	TAL CHI
					(Start)	02/13/15 15:09		
					(End)	02/13/15 15:12		
Total/NA	Analysis	SM 3500 CR D		1	99701	02/13/15 09:16	RWE	TAL WFD
Total/NA	Analysis	SM 3500 CR D		1	99711	02/19/15 08:09	RWE	TAL WFD

Client Sample ID: OC-TB

Lab Sample ID: 480-75432-2

Date Collected: 02/12/15 00:00

Matrix: Water

Date Received: 02/13/15 03:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	227080	02/17/15 19:49	NMD1	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Laboratory: TestAmerica Buffalo

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

Laboratory: TestAmerica Chicago

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40461	04-30-15
California	State Program	9	2903	04-30-15
Georgia	State Program	4	N/A	04-30-15
Georgia	State Program	4	939	04-30-15
Hawaii	State Program	9	N/A	04-30-15
Illinois	NELAP	5	100201	04-30-15
Indiana	State Program	5	C-IL-02	04-30-15
Iowa	State Program	7	82	05-01-16
Kansas	NELAP	7	E-10161	03-31-15 *
Kentucky (UST)	State Program	4	66	04-30-15
Kentucky (WW)	State Program	4	KY90023	12-31-15
Massachusetts	State Program	1	M-IL035	06-30-15
Mississippi	State Program	4	N/A	04-30-15
New York	NELAP	2	IL00035	03-31-15
North Carolina (WW/SW)	State Program	4	291	12-31-15
North Dakota	State Program	8	R-194	04-30-15
Oklahoma	State Program	6	8908	08-31-15
South Carolina	State Program	4	77001	04-30-15
USDA	Federal		P330-15-00038	02-11-18
Wisconsin	State Program	5	999580010	08-31-15
Wyoming	State Program	8	8TMS-Q	04-30-15

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	03-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-15
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-15
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Laboratory: TestAmerica Pittsburgh (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-15

Laboratory: TestAmerica Westfield

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0494	09-30-16
Massachusetts	State Program	1	M-MA014	06-30-15
New Hampshire	NELAP	1	2539	08-08-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL BUF
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
608	Polychlorinated Biphenyls (PCBs) (GC)	40CFR136A	TAL PIT
8011	EDB, DBCP, and 1,2,3-TCP (GC)	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
245.1	Mercury (CVAA)	EPA	TAL PIT
1664A	HEM and SGT-HEM	1664A	TAL CHI
335.4	Cyanide, Total	MCAWW	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL CHI
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL CHI
SM 3500 CR D	Chromium, Hexavalent	SM	TAL WFD
SM 3500 CR D	Chromium, Trivalent	SM	TAL WFD

Protocol References:

1664A = EPA-821-98-002

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

MA DEP = Massachusetts Department Of Environmental Protection

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL CHI = TestAmerica Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL WFD = TestAmerica Westfield, 501 Southhampton Rd., Suite C, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-75432-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-75432-1	OC-ANN. RGP INFLUENT	Water	02/12/15 09:30	02/13/15 03:00
480-75432-2	OC-TB	Water	02/12/15 00:00	02/13/15 03:00

TestAmerica Westfield

480-75432 Chain of Custody

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sampler: L JOHNSON	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-62708-13114.1
Phone: 978-658-6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation			Job #:

Address: 51 Eames street	Due Date Requested:	
City: Wilmington	TAT Requested (days): A.S.A.P.	
State, Zip: MA, 01887	PO #: REWI0025	
Phone: 423-336-4012(Tel)	WO #:	
Email: beguichard@olin.com	Project #: 48006853	
Project Name: Wilmington Plant B RPG	SSOW#:	
Site:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	3500_CR_D - Chromium (hexavalent)/Trivalent Cr	200.7, 245.1	1664A_Calc - TPH 1664	420.4 - Phenolics, Total Recoverable	8011 - Ethylene Dibromide	8260MCP - RGP full list 8260	8270D_LL - RGP full list 8270	608_PCB - PCB 608	2540D, 300.0_28D	335.4 - Cyanide, Total	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	S	S	A	A	N	N	N	B		
ANN. RGP Influent	2-12-15	0930	G	Water			X	X	X	X	X	X	X	X	X	X		Includes TRIP blanks
				Water														

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 2-12-15	Company	Received by:	Date/Time: 2-12-15 1120	Company
Relinquished by:	Date/Time: 2-12-15 1700	Company	Received by:	Date/Time: 13 FEB 15 0300	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.7 #3

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-75432-1

Login Number: 75432

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	No: Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-75432-1

Login Number: 75432
List Number: 3
Creator: Kelsey, Shawn M

List Source: TestAmerica Chicago
List Creation: 02/13/15 10:23 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-75432-1

Login Number: 75432
List Number: 4
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 02/13/15 12:20 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-75432-1

Login Number: 75432
List Number: 2
Creator: Emerich, Rich W

List Source: TestAmerica Westfield
List Creation: 02/13/15 10:49 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-68607-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/9/2014 9:56:11 AM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Job ID: 480-68607-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/4/2014 1:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.6º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 120430. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Client Sample ID: OC-FRAC 100314

Lab Sample ID: 480-68607-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.13	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	250	B	5.0	0.98	mg/L	5		300.0	Total/NA
Nickel	1.1	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	19	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.12		0.010	0.0050	mg/L	1		420.4	Total/NA
Chlorine, Total Residual	0.030	HF	0.020	0.010	mg/L	1		SM 4500 Cl G	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-FRAC 100314

Date Collected: 10/03/14 10:00
Date Received: 10/04/14 01:50

Lab Sample ID: 480-68607-1

Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/06/14 08:03	10/07/14 18:14	1
Butyl benzyl phthalate	**0.13**	**J**	0.94	0.13	ug/L		10/06/14 08:03	10/07/14 18:14	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/06/14 08:03	10/07/14 18:14	1
Diethyl phthalate	ND		0.94	0.14	ug/L		10/06/14 08:03	10/07/14 18:14	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/06/14 08:03	10/07/14 18:14	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/06/14 08:03	10/07/14 18:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*	*10/06/14 08:03*	*10/07/14 18:14*	*1*
2-Fluorobiphenyl	*63*		*19 - 107*	*10/06/14 08:03*	*10/07/14 18:14*	*1*
2-Fluorophenol (Surr)	*60*		*10 - 111*	*10/06/14 08:03*	*10/07/14 18:14*	*1*
Nitrobenzene-d5 (Surr)	*62*		*23 - 112*	*10/06/14 08:03*	*10/07/14 18:14*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*10/06/14 08:03*	*10/07/14 18:14*	*1*
Terphenyl-d14	*77*		*10 - 132*	*10/06/14 08:03*	*10/07/14 18:14*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**250**	**B**	5.0	0.98	mg/L			10/04/14 23:11	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/05/14 11:22	10/08/14 23:38	1
Iron	ND		50	9.5	ug/L		10/05/14 11:22	10/08/14 23:38	1
Nickel	**1.1**	**J**	10	0.51	ug/L		10/05/14 11:22	10/08/14 23:38	1
Zinc	**19**	**B**	10	1.0	ug/L		10/05/14 11:22	10/08/14 23:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.12**		0.010	0.0050	mg/L		10/06/14 18:35	10/07/14 11:19	1
Chlorine, Total Residual	**0.030**	**HF**	0.020	0.010	mg/L			10/04/14 13:10	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/06/14 03:05	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-68607-1	OC-FRAC 100314	67	63	60	62	63	77		
LCS 180-120430/2-A	Lab Control Sample	70	67	75	68	75	70		
LCSD 180-120430/3-A	Lab Control Sample Dup	73	68	75	72	75	70		
MB 180-120430/1-A	Method Blank	68	65	66	67	67	64		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-120430/1-A
Matrix: Water
Analysis Batch: 120628

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 120430

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/06/14 08:03	10/07/14 12:13	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/06/14 08:03	10/07/14 12:13	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/06/14 08:03	10/07/14 12:13	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/06/14 08:03	10/07/14 12:13	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/06/14 08:03	10/07/14 12:13	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/06/14 08:03	10/07/14 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*	*10/06/14 08:03*	*10/07/14 12:13*	*1*
2-Fluorobiphenyl	*65*		*19 - 107*	*10/06/14 08:03*	*10/07/14 12:13*	*1*
2-Fluorophenol (Surr)	*66*		*10 - 111*	*10/06/14 08:03*	*10/07/14 12:13*	*1*
Nitrobenzene-d5 (Surr)	*67*		*23 - 112*	*10/06/14 08:03*	*10/07/14 12:13*	*1*
Phenol-d5 (Surr)	*67*		*15 - 112*	*10/06/14 08:03*	*10/07/14 12:13*	*1*
Terphenyl-d14	*64*		*10 - 132*	*10/06/14 08:03*	*10/07/14 12:13*	*1*

Lab Sample ID: LCS 180-120430/2-A
Matrix: Water
Analysis Batch: 120628

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 120430

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.6		ug/L		78	20 - 116
Butyl benzyl phthalate	20.0	15.5		ug/L		77	36 - 108
Di-n-butyl phthalate	20.0	14.7		ug/L		74	37 - 111
Diethyl phthalate	20.0	14.8		ug/L		74	36 - 109
Dimethyl phthalate	20.0	14.5		ug/L		72	37 - 106
Di-n-octyl phthalate	20.0	15.7		ug/L		78	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*
2-Fluorobiphenyl	*67*		*19 - 107*
2-Fluorophenol (Surr)	*75*		*10 - 111*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*
Phenol-d5 (Surr)	*75*		*15 - 112*
Terphenyl-d14	*70*		*10 - 132*

Lab Sample ID: LCSD 180-120430/3-A
Matrix: Water
Analysis Batch: 120628

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120430

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		78	20 - 116	1	40
Butyl benzyl phthalate	20.0	15.2		ug/L		76	36 - 108	2	40
Di-n-butyl phthalate	20.0	15.1		ug/L		75	37 - 111	3	38
Diethyl phthalate	20.0	15.1		ug/L		75	36 - 109	2	39
Dimethyl phthalate	20.0	14.6		ug/L		73	37 - 106	1	42
Di-n-octyl phthalate	20.0	15.4		ug/L		77	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-120430/3-A
Matrix: Water
Analysis Batch: 120628

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120430

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*75*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*75*		*15 - 112*
Terphenyl-d14	*70*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-120353/50
Matrix: Water
Analysis Batch: 120353

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.67	J	5.0	0.98	mg/L			10/04/14 20:44	5

Lab Sample ID: LCS 180-120353/49
Matrix: Water
Analysis Batch: 120353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	53.1		mg/L		106	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-120404/1-A
Matrix: Water
Analysis Batch: 120869

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 120404

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/05/14 11:22	10/08/14 23:28	1
Iron	ND		50	9.5	ug/L		10/05/14 11:22	10/08/14 23:28	1
Nickel	ND		10	0.51	ug/L		10/05/14 11:22	10/08/14 23:28	1
Zinc	ND		10	1.0	ug/L		10/05/14 11:22	10/08/14 23:28	1

Lab Sample ID: LCS 180-120404/2-A
Matrix: Water
Analysis Batch: 120869

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 120404

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	526		ug/L		105	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	511		ug/L		102	85 - 115
Zinc	500	520		ug/L		104	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 480-68607-1 MS
Matrix: Water
Analysis Batch: 120869

Client Sample ID: OC-FRAC 100314
Prep Type: Total Recoverable
Prep Batch: 120404

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		500	536		ug/L		107	70 - 130
Iron	ND		1000	1020		ug/L		102	70 - 130
Nickel	1.1	J	500	511		ug/L		102	70 - 130
Zinc	19	B	500	529		ug/L		102	70 - 130

Lab Sample ID: 480-68607-1 MSD
Matrix: Water
Analysis Batch: 120869

Client Sample ID: OC-FRAC 100314
Prep Type: Total Recoverable
Prep Batch: 120404

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		500	525		ug/L		105	70 - 130	2	20
Iron	ND		1000	1020		ug/L		102	70 - 130	1	20
Nickel	1.1	J	500	508		ug/L		101	70 - 130	1	20
Zinc	19	B	500	522		ug/L		101	70 - 130	1	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-206255/1-A
Matrix: Water
Analysis Batch: 206380

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 206255

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/06/14 18:35	10/07/14 10:28	1

Lab Sample ID: LCS 480-206255/2-A
Matrix: Water
Analysis Batch: 206380

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 206255

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.105		mg/L		105	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-206105/1
Matrix: Water
Analysis Batch: 206105

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/06/14 03:05	1

Lab Sample ID: LCS 480-206105/2
Matrix: Water
Analysis Batch: 206105

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	257	230		mg/L		90	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-206079/3
Matrix: Water
Analysis Batch: 206079

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/04/14 13:10	1

Lab Sample ID: LCS 480-206079/4
Matrix: Water
Analysis Batch: 206079

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chlorine, Total Residual			0.920	0.940		mg/L		102	90 - 110		

Lab Sample ID: 480-68607-1 DU
Matrix: Water
Analysis Batch: 206079

Client Sample ID: OC-FRAC 100314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	0.030	HF		0.0300		mg/L				0	20

GC/MS Semi VOA

Prep Batch: 120430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	3520C	
LCS 180-120430/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-120430/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-120430/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 120628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	8270C LL	120430
LCS 180-120430/2-A	Lab Control Sample	Total/NA	Water	8270C LL	120430
LCSD 180-120430/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	120430
MB 180-120430/1-A	Method Blank	Total/NA	Water	8270C LL	120430

HPLC/IC

Analysis Batch: 120353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	300.0	
LCS 180-120353/49	Lab Control Sample	Total/NA	Water	300.0	
MB 180-120353/50	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 120404

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total Recoverable	Water	200.7	
480-68607-1 MS	OC-FRAC 100314	Total Recoverable	Water	200.7	
480-68607-1 MSD	OC-FRAC 100314	Total Recoverable	Water	200.7	
LCS 180-120404/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-120404/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 120869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total Recoverable	Water	200.7 Rev 4.4	120404
480-68607-1 MS	OC-FRAC 100314	Total Recoverable	Water	200.7 Rev 4.4	120404
480-68607-1 MSD	OC-FRAC 100314	Total Recoverable	Water	200.7 Rev 4.4	120404
LCS 180-120404/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	120404
MB 180-120404/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	120404

General Chemistry

Analysis Batch: 206079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	SM 4500 Cl G	
480-68607-1 DU	OC-FRAC 100314	Total/NA	Water	SM 4500 Cl G	
LCS 480-206079/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-206079/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 206105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Analysis Batch: 206105 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-206105/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-206105/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 206255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	Distill/Phenol	
LCS 480-206255/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-206255/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 206380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68607-1	OC-FRAC 100314	Total/NA	Water	420.4	206255
LCS 480-206255/2-A	Lab Control Sample	Total/NA	Water	420.4	206255
MB 480-206255/1-A	Method Blank	Total/NA	Water	420.4	206255

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Client Sample ID: OC-FRAC 100314
Date Collected: 10/03/14 10:00
Date Received: 10/04/14 01:50

Lab Sample ID: 480-68607-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			120430	10/06/14 08:03	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	120628	10/07/14 18:14	VVP	TAL PIT
Total/NA	Analysis	300.0		5	120353	10/04/14 23:11	MJH	TAL PIT
Total Recoverable	Prep	200.7			120404	10/05/14 11:22	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	120869	10/08/14 23:38	RJR	TAL PIT
Total/NA	Prep	Distill/Phenol			206255	10/06/14 18:35	CLT	TAL BUF
Total/NA	Analysis	420.4		1	206380	10/07/14 11:19	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	206105	10/06/14 03:05	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	206079	10/04/14 13:10	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68607-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-68607-1	OC-FRAC 100314	Water	10/03/14 10:00	10/04/14 01:50

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG FA	Project #: 48006853			
Site: Wilmington MA	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	Sample Specific Analysis	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
Frac4. 100314	10.3.14	1000	G	Water			X		X	X	X	X	X		
				Water											

480-68607 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-3-14			10-3-14 1100	TAL
2	Relinquished by:	Date/Time: 10-3-14	Company	Received by:	Date/Time: 10/04/14 0150	Company TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.6 #1

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68607-1

Login Number: 68607

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	False	subcon lab to check rc

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68607-1

Login Number: 68607
List Number: 2
Creator: Butcher, Ryan M

List Source: TestAmerica Pittsburgh
List Creation: 10/04/14 02:48 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-68671-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/10/2014 4:43:48 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-68671-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/7/2014 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC FRAC 5. 100614 (480-68671-1).

Method 420.4: The method blank for batch 206996 was above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.OC FRAC 5. 100614 (480-68671-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 120646. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Client Sample ID: OC FRAC 5. 100614

Lab Sample ID: 480-68671-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		2.5	0.49	mg/L	2.5		300.0	Total/NA
Nickel	0.97	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	21	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.0050	J B	0.010	0.0050	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Client Sample ID: OC FRAC 5. 100614
Date Collected: 10/06/14 10:00
Date Received: 10/07/14 02:00

Lab Sample ID: 480-68671-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/07/14 12:59	10/08/14 18:17	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		10/07/14 12:59	10/08/14 18:17	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/07/14 12:59	10/08/14 18:17	1
Diethyl phthalate	ND		0.94	0.14	ug/L		10/07/14 12:59	10/08/14 18:17	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/07/14 12:59	10/08/14 18:17	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/07/14 12:59	10/08/14 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*60*		*16 - 122*	*10/07/14 12:59*	*10/08/14 18:17*	*1*
2-Fluorobiphenyl	*53*		*19 - 107*	*10/07/14 12:59*	*10/08/14 18:17*	*1*
2-Fluorophenol (Surr)	*55*		*10 - 111*	*10/07/14 12:59*	*10/08/14 18:17*	*1*
Nitrobenzene-d5 (Surr)	*55*		*23 - 112*	*10/07/14 12:59*	*10/08/14 18:17*	*1*
Phenol-d5 (Surr)	*53*		*15 - 112*	*10/07/14 12:59*	*10/08/14 18:17*	*1*
Terphenyl-d14	*70*		*10 - 132*	*10/07/14 12:59*	*10/08/14 18:17*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		2.5	0.49	mg/L			10/10/14 14:41	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/08/14 05:49	10/09/14 03:02	1
Iron	ND		50	9.5	ug/L		10/08/14 05:49	10/09/14 03:02	1
Nickel	**0.97**	**J**	10	0.51	ug/L		10/08/14 05:49	10/09/14 03:02	1
Zinc	**21**	**B**	10	1.0	ug/L		10/08/14 05:49	10/09/14 03:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0050**	**J B**	0.010	0.0050	mg/L		10/07/14 17:00	10/09/14 20:36	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/08/14 12:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/08/14 18:37	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-68671-1	OC FRAC 5. 100614	60	53	55	55	53	70		
LCS 180-120646/2-A	Lab Control Sample	85	72	82	82	80	77		
LCSD 180-120646/3-A	Lab Control Sample Dup	86	71	86	81	84	76		
MB 180-120646/1-A	Method Blank	68	73	83	80	78	76		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-120646/1-A
Matrix: Water
Analysis Batch: 120737

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 120646

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/07/14 12:59	10/08/14 15:51	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/07/14 12:59	10/08/14 15:51	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/07/14 12:59	10/08/14 15:51	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/07/14 12:59	10/08/14 15:51	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/07/14 12:59	10/08/14 15:51	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/07/14 12:59	10/08/14 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*	*10/07/14 12:59*	*10/08/14 15:51*	*1*
2-Fluorobiphenyl	*73*		*19 - 107*	*10/07/14 12:59*	*10/08/14 15:51*	*1*
2-Fluorophenol (Surr)	*83*		*10 - 111*	*10/07/14 12:59*	*10/08/14 15:51*	*1*
Nitrobenzene-d5 (Surr)	*80*		*23 - 112*	*10/07/14 12:59*	*10/08/14 15:51*	*1*
Phenol-d5 (Surr)	*78*		*15 - 112*	*10/07/14 12:59*	*10/08/14 15:51*	*1*
Terphenyl-d14	*76*		*10 - 132*	*10/07/14 12:59*	*10/08/14 15:51*	*1*

Lab Sample ID: LCS 180-120646/2-A
Matrix: Water
Analysis Batch: 120737

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 120646

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.9		ug/L		75	20 - 116
Butyl benzyl phthalate	20.0	15.4		ug/L		77	36 - 108
Di-n-butyl phthalate	20.0	15.3		ug/L		76	37 - 111
Diethyl phthalate	20.0	15.3		ug/L		77	36 - 109
Dimethyl phthalate	20.0	14.8		ug/L		74	37 - 106
Di-n-octyl phthalate	20.0	14.1		ug/L		70	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*85*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*82*		*10 - 111*
Nitrobenzene-d5 (Surr)	*82*		*23 - 112*
Phenol-d5 (Surr)	*80*		*15 - 112*
Terphenyl-d14	*77*		*10 - 132*

Lab Sample ID: LCSD 180-120646/3-A
Matrix: Water
Analysis Batch: 120737

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120646

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.2		ug/L		76	20 - 116	2	40
Butyl benzyl phthalate	20.0	15.7		ug/L		79	36 - 108	2	40
Di-n-butyl phthalate	20.0	15.4		ug/L		77	37 - 111	1	38
Diethyl phthalate	20.0	15.7		ug/L		79	36 - 109	3	39
Dimethyl phthalate	20.0	15.0		ug/L		75	37 - 106	2	42
Di-n-octyl phthalate	20.0	14.5		ug/L		72	11 - 127	3	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-120646/3-A
Matrix: Water
Analysis Batch: 120737

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120646

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*86*		*16 - 122*
2-Fluorobiphenyl	*71*		*19 - 107*
2-Fluorophenol (Surr)	*86*		*10 - 111*
Nitrobenzene-d5 (Surr)	*81*		*23 - 112*
Phenol-d5 (Surr)	*84*		*15 - 112*
Terphenyl-d14	*76*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-120895/83
Matrix: Water
Analysis Batch: 120895

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/10/14 08:46	1

Lab Sample ID: LCS 180-120895/82
Matrix: Water
Analysis Batch: 120895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.2		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-120700/1-A
Matrix: Water
Analysis Batch: 120869

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 120700

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/08/14 05:49	10/09/14 02:47	1
Iron	ND		50	9.5	ug/L		10/08/14 05:49	10/09/14 02:47	1
Nickel	ND		10	0.51	ug/L		10/08/14 05:49	10/09/14 02:47	1
Zinc	2.00	J	10	1.0	ug/L		10/08/14 05:49	10/09/14 02:47	1

Lab Sample ID: PB 180-120423/1-E
Matrix: Water
Analysis Batch: 120869

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 120700

Analyte	PB Result	PB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/08/14 05:49	10/09/14 02:52	1
Iron	ND		50	9.5	ug/L		10/08/14 05:49	10/09/14 02:52	1
Nickel	ND		10	0.51	ug/L		10/08/14 05:49	10/09/14 02:52	1
Zinc	2.10	J	10	1.0	ug/L		10/08/14 05:49	10/09/14 02:52	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-120700/3-A
Matrix: Water
Analysis Batch: 120869

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 120700

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	536		ug/L		107	85 - 115
Iron	1000	1040		ug/L		104	85 - 115
Nickel	500	505		ug/L		101	85 - 115
Zinc	500	515		ug/L		103	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-206467/1-A
Matrix: Water
Analysis Batch: 206996

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 206467

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.00567	J	0.010	0.0050	mg/L		10/07/14 17:00	10/09/14 19:13	1

Lab Sample ID: LCS 480-206467/2-A
Matrix: Water
Analysis Batch: 206996

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 206467

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0948		mg/L		95	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-206700/1
Matrix: Water
Analysis Batch: 206700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/08/14 18:37	1

Lab Sample ID: LCS 480-206700/2
Matrix: Water
Analysis Batch: 206700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	266	248		mg/L		93	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-206639/3
Matrix: Water
Analysis Batch: 206639

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/08/14 12:20	1

Method: SM 4500 Cl G - Chlorine, Residual (Continued)

Lab Sample ID: LCS 480-206639/4
Matrix: Water
Analysis Batch: 206639

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.910		mg/L		99	90 - 110

Lab Sample ID: 480-68671-1 DU
Matrix: Water
Analysis Batch: 206639

Client Sample ID: OC FRAC 5. 100614
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

GC/MS Semi VOA

Prep Batch: 120646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	3520C	
LCS 180-120646/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-120646/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-120646/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 120737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	8270C LL	120646
LCS 180-120646/2-A	Lab Control Sample	Total/NA	Water	8270C LL	120646
LCSD 180-120646/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	120646
MB 180-120646/1-A	Method Blank	Total/NA	Water	8270C LL	120646

HPLC/IC

Analysis Batch: 120895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	300.0	
LCS 180-120895/82	Lab Control Sample	Total/NA	Water	300.0	
MB 180-120895/83	Method Blank	Total/NA	Water	300.0	

Metals

Filtration Batch: 120423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
PB 180-120423/1-E	Method Blank	Total Recoverable	Water	Filtration	

Prep Batch: 120700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total Recoverable	Water	200.7	
LCS 180-120700/3-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-120700/1-A	Method Blank	Total Recoverable	Water	200.7	
PB 180-120423/1-E	Method Blank	Total Recoverable	Water	200.7	120423

Analysis Batch: 120869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total Recoverable	Water	200.7 Rev 4.4	120700
LCS 180-120700/3-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	120700
MB 180-120700/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	120700
PB 180-120423/1-E	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	120700

General Chemistry

Prep Batch: 206467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	Distill/Phenol	
LCS 480-206467/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-206467/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Analysis Batch: 206639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	SM 4500 Cl G	
480-68671-1 DU	OC FRAC 5. 100614	Total/NA	Water	SM 4500 Cl G	
LCS 480-206639/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-206639/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 206700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	SM 2540D	
LCS 480-206700/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-206700/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 206996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68671-1	OC FRAC 5. 100614	Total/NA	Water	420.4	206467
LCS 480-206467/2-A	Lab Control Sample	Total/NA	Water	420.4	206467
MB 480-206467/1-A	Method Blank	Total/NA	Water	420.4	206467

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Client Sample ID: OC FRAC 5. 100614
Date Collected: 10/06/14 10:00
Date Received: 10/07/14 02:00

Lab Sample ID: 480-68671-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			120646	10/07/14 12:59	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	120737	10/08/14 18:17	VVP	TAL PIT
Total/NA	Analysis	300.0		2.5	120895	10/10/14 14:41	CMR	TAL PIT
Total Recoverable	Prep	200.7			120700	10/08/14 05:49	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	120869	10/09/14 03:02	RJR	TAL PIT
Total/NA	Prep	Distill/Phenol			206467	10/07/14 17:00	CLT	TAL BUF
Total/NA	Analysis	420.4		1	206996	10/09/14 20:36	JMB	TAL BUF
Total/NA	Analysis	SM 2540D		1	206700	10/08/14 18:37	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	206639	10/08/14 12:20	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68671-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-68671-1	OC FRAC 5. 100614	Water	10/06/14 10:00	10/07/14 02:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody

480-68671 Chain of Custody

TestAmerica

Client Information	Sampler: L JOHNSON	Lab PM: Mason, Becky C
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testam
Company: Olin Corporation		
Address: 51 Eames street	Due Date Requested:	
City: Wilmington	TAT Requested (days): A.S.A.P.	
State, Zip: MA, 01887		
Phone: 978 658 6121	PO #: REWI0020	
Email: beguichard@olin.com	WO #:	
Project Name: Wilmington Plant B RPG F5	Project #: 48006853	
Site: WILMINGTON MA	SSOW#:	

COC No: 0-41314-10069.1
Page: Page 1 of 1
Job #:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 5. 100614	10-6-14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 10-6-14	Company	Received by:	Date/Time: 10-6-14 1400	Company TA	
Relinquished by:	Date/Time: 10-6-14 1630	Company TA	Received by:	Date/Time: 10/7/14 0200	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.0C #1

10/10/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68671-1

Login Number: 68671

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68671-1

Login Number: 68671
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/07/14 12:34 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-68955-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/14/2014 4:17:01 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
*	LCS or LCSD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Job ID: 480-68955-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/9/2014 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC FRAC 3. 100814 (480-68955-1).

Method 420.4: The sample duplicate precision for the following sample associated with batch 200896 was outside control limits: OC FRAC 3. 100814 (480-68955-1).

Method(s) 420.4: The sample and associated batch QC exhibited high bias due to trace contamination during the digestion process. Since the resulting data is biased high but below project discharge DQOs the data has been reported. OC FRAC 3. 100814 (480-68955-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 120909. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Client Sample ID: OC FRAC 3. 100814

Lab Sample ID: 480-68955-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		2.5	0.49	mg/L	2.5		300.0	Total/NA
Arsenic	4.3	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	16	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.017	*	0.010	0.0050	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Client Sample ID: OC FRAC 3. 100814
Date Collected: 10/08/14 10:00
Date Received: 10/09/14 02:00

Lab Sample ID: 480-68955-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/09/14 11:20	10/10/14 18:13	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		10/09/14 11:20	10/10/14 18:13	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		10/09/14 11:20	10/10/14 18:13	1
Diethyl phthalate	ND		0.95	0.14	ug/L		10/09/14 11:20	10/10/14 18:13	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		10/09/14 11:20	10/10/14 18:13	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		10/09/14 11:20	10/10/14 18:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*	*10/09/14 11:20*	*10/10/14 18:13*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*10/09/14 11:20*	*10/10/14 18:13*	*1*
2-Fluorophenol (Surr)	*62*		*10 - 111*	*10/09/14 11:20*	*10/10/14 18:13*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*10/09/14 11:20*	*10/10/14 18:13*	*1*
Phenol-d5 (Surr)	*58*		*15 - 112*	*10/09/14 11:20*	*10/10/14 18:13*	*1*
Terphenyl-d14	*77*		*10 - 132*	*10/09/14 11:20*	*10/10/14 18:13*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		2.5	0.49	mg/L			10/14/14 02:06	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.3**	**J**	10	3.0	ug/L		10/10/14 10:59	10/13/14 14:19	1
Iron	ND		50	9.5	ug/L		10/10/14 10:59	10/13/14 14:19	1
Nickel	ND		10	0.51	ug/L		10/10/14 10:59	10/13/14 14:19	1
Zinc	**16**	**B**	10	1.0	ug/L		10/10/14 10:59	10/13/14 14:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.017**	*****	0.010	0.0050	mg/L		10/10/14 13:00	10/14/14 11:07	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/10/14 15:59	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/13/14 15:14	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-68955-1	OC FRAC 3. 100814	73	64	62	70	58	77		
LCS 180-120909/2-A	Lab Control Sample	89	82	83	88	75	77		
LCSD 180-120909/3-A	Lab Control Sample Dup	88	78	79	85	73	75		
MB 180-120909/1-A	Method Blank	84	77	86	85	76	82		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-120909/1-A
Matrix: Water
Analysis Batch: 121038

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 120909

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/09/14 11:20	10/10/14 13:26	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/09/14 11:20	10/10/14 13:26	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/09/14 11:20	10/10/14 13:26	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/09/14 11:20	10/10/14 13:26	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/09/14 11:20	10/10/14 13:26	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/09/14 11:20	10/10/14 13:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*84*		*16 - 122*	*10/09/14 11:20*	*10/10/14 13:26*	*1*
2-Fluorobiphenyl	*77*		*19 - 107*	*10/09/14 11:20*	*10/10/14 13:26*	*1*
2-Fluorophenol (Surr)	*86*		*10 - 111*	*10/09/14 11:20*	*10/10/14 13:26*	*1*
Nitrobenzene-d5 (Surr)	*85*		*23 - 112*	*10/09/14 11:20*	*10/10/14 13:26*	*1*
Phenol-d5 (Surr)	*76*		*15 - 112*	*10/09/14 11:20*	*10/10/14 13:26*	*1*
Terphenyl-d14	*82*		*10 - 132*	*10/09/14 11:20*	*10/10/14 13:26*	*1*

Lab Sample ID: LCS 180-120909/2-A
Matrix: Water
Analysis Batch: 121038

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 120909

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	19.1		ug/L		96	20 - 116
Butyl benzyl phthalate	20.0	17.9		ug/L		89	36 - 108
Di-n-butyl phthalate	20.0	18.5		ug/L		93	37 - 111
Diethyl phthalate	20.0	18.1		ug/L		91	36 - 109
Dimethyl phthalate	20.0	17.4		ug/L		87	37 - 106
Di-n-octyl phthalate	20.0	16.4		ug/L		82	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*89*		*16 - 122*
2-Fluorobiphenyl	*82*		*19 - 107*
2-Fluorophenol (Surr)	*83*		*10 - 111*
Nitrobenzene-d5 (Surr)	*88*		*23 - 112*
Phenol-d5 (Surr)	*75*		*15 - 112*
Terphenyl-d14	*77*		*10 - 132*

Lab Sample ID: LCSD 180-120909/3-A
Matrix: Water
Analysis Batch: 121038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120909

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	18.2		ug/L		91	20 - 116	5	40
Butyl benzyl phthalate	20.0	17.7		ug/L		88	36 - 108	1	40
Di-n-butyl phthalate	20.0	17.9		ug/L		90	37 - 111	3	38
Diethyl phthalate	20.0	17.7		ug/L		88	36 - 109	3	39
Dimethyl phthalate	20.0	16.5		ug/L		83	37 - 106	5	42
Di-n-octyl phthalate	20.0	15.8		ug/L		79	11 - 127	4	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-120909/3-A
Matrix: Water
Analysis Batch: 121038

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 120909

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*88*		*16 - 122*
2-Fluorobiphenyl	*78*		*19 - 107*
2-Fluorophenol (Surr)	*79*		*10 - 111*
Nitrobenzene-d5 (Surr)	*85*		*23 - 112*
Phenol-d5 (Surr)	*73*		*15 - 112*
Terphenyl-d14	*75*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-121227/44
Matrix: Water
Analysis Batch: 121227

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/13/14 18:28	1

Lab Sample ID: LCS 180-121227/43
Matrix: Water
Analysis Batch: 121227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.4		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-121042/1-A
Matrix: Water
Analysis Batch: 121314

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 121042

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/10/14 10:59	10/13/14 14:09	1
Iron	36.6	J	50	9.5	ug/L		10/10/14 10:59	10/13/14 14:09	1
Nickel	ND		10	0.51	ug/L		10/10/14 10:59	10/13/14 14:09	1
Zinc	2.52	J	10	1.0	ug/L		10/10/14 10:59	10/13/14 14:09	1

Lab Sample ID: LCS 180-121042/2-A
Matrix: Water
Analysis Batch: 121314

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 121042

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	562		ug/L		112	85 - 115
Iron	1000	1040		ug/L		104	85 - 115
Nickel	500	520		ug/L		104	85 - 115
Zinc	500	530		ug/L		106	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-207173/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207675 — **Prep Batch: 207173**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/10/14 13:00	10/14/14 08:50	1

Lab Sample ID: LCS 480-207173/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207675 — **Prep Batch: 207173**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.136	*	mg/L		136	90 - 110

Lab Sample ID: 480-68955-1 DU — **Client Sample ID: OC FRAC 3. 100814**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207675 — **Prep Batch: 207173**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phenolics, Total Recoverable	0.017	*	ND	*	mg/L		NC	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-207483/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207483

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/13/14 15:14	1

Lab Sample ID: LCS 480-207483/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	264	248		mg/L		94	88 - 110

Lab Sample ID: 480-68955-1 DU — **Client Sample ID: OC FRAC 3. 100814**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207483

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	15

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-207181/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207181

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/10/14 15:59	1

Method: SM 4500 Cl G - Chlorine, Residual (Continued)

Lab Sample ID: LCS 480-207181/4
Matrix: Water
Analysis Batch: 207181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.920		mg/L		100	90 - 110

Lab Sample ID: 480-68955-1 DU
Matrix: Water
Analysis Batch: 207181

Client Sample ID: OC FRAC 3. 100814
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

GC/MS Semi VOA

Prep Batch: 120909

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	3520C	
LCS 180-120909/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-120909/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-120909/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 121038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	8270C LL	120909
LCS 180-120909/2-A	Lab Control Sample	Total/NA	Water	8270C LL	120909
LCSD 180-120909/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	120909
MB 180-120909/1-A	Method Blank	Total/NA	Water	8270C LL	120909

HPLC/IC

Analysis Batch: 121227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	300.0	
LCS 180-121227/43	Lab Control Sample	Total/NA	Water	300.0	
MB 180-121227/44	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 121042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total Recoverable	Water	200.7	
LCS 180-121042/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-121042/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 121314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total Recoverable	Water	200.7 Rev 4.4	121042
LCS 180-121042/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	121042
MB 180-121042/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	121042

General Chemistry

Prep Batch: 207173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	Distill/Phenol	
480-68955-1 DU	OC FRAC 3. 100814	Total/NA	Water	Distill/Phenol	
LCS 480-207173/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-207173/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 207181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	SM 4500 Cl G	
480-68955-1 DU	OC FRAC 3. 100814	Total/NA	Water	SM 4500 Cl G	
LCS 480-207181/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-207181/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

General Chemistry (Continued)

Analysis Batch: 207483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	SM 2540D	
480-68955-1 DU	OC FRAC 3. 100814	Total/NA	Water	SM 2540D	
LCS 480-207483/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-207483/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 207675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-68955-1	OC FRAC 3. 100814	Total/NA	Water	420.4	207173
480-68955-1 DU	OC FRAC 3. 100814	Total/NA	Water	420.4	207173
LCS 480-207173/2-A	Lab Control Sample	Total/NA	Water	420.4	207173
MB 480-207173/1-A	Method Blank	Total/NA	Water	420.4	207173

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Client Sample ID: OC FRAC 3. 100814
Date Collected: 10/08/14 10:00
Date Received: 10/09/14 02:00

Lab Sample ID: 480-68955-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			120909	10/09/14 11:20	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	121038	10/10/14 18:13	VVP	TAL PIT
Total/NA	Analysis	300.0		2.5	121227	10/14/14 02:06	CMR	TAL PIT
Total Recoverable	Prep	200.7			121042	10/10/14 10:59	LEM	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	121314	10/13/14 14:19	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			207173	10/10/14 13:00	RP	TAL BUF
Total/NA	Analysis	420.4		1	207675	10/14/14 11:07	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	207483	10/13/14 15:14	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	207181	10/10/14 15:59	KMF	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-68955-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-68955-1	OC FRAC 3. 100814	Water	10/08/14 10:00	10/09/14 02:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody

480-68955 Chain of Custody

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	No: 11314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamerica	1 of 1
Company: Olin Corporation		**Analysis Requested**	Job #:
Address: 51 Eames street	Due Date Requested:		
City: Wilmington	TAT Requested (days): A.S.A.P.		
State, Zip: MA, 01887			
Phone: 978 658 6121	PO #: REWI0020		
Email: beguichard@olin.com	WO #:		
Project Name: Wilmington Plant B RPG F3	Project #: 48006853		
Site: WILMINGTON MA	SSOW#:		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 3 · 100814	10.8.14	1000	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 10.8.14	Company	Received by:	Date/Time: 10-8-14 1130	Company TAL
Relinquished by:	Date/Time: 10-8-14 1130	Company	Received by:	Date/Time: 10/09/14 0200	Company TA
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2 #1

10/14/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68955-1

Login Number: 68955

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-68955-1

Login Number: 68955
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/09/14 11:11 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-69112-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/15/2014 2:55:28 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Job ID: 480-69112-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/11/2014 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.0º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: FRAC 1 101014 (480-69112-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Client Sample ID: FRAC 1 101014

Lab Sample ID: 480-69112-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.15	J	0.95	0.14	ug/L	1		8270C LL	Total/NA
Chloride	240		2.5	0.49	mg/L	2.5		300.0	Total/NA
Arsenic	3.9	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.96	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	31		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.0059	J	0.010	0.0050	mg/L	1		420.4	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FRAC 1 101014
Date Collected: 10/10/14 10:10
Date Received: 10/11/14 02:00

Lab Sample ID: 480-69112-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/12/14 16:13	10/14/14 20:25	1
Butyl benzyl phthalate	**0.15**	**J**	0.95	0.14	ug/L		10/12/14 16:13	10/14/14 20:25	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		10/12/14 16:13	10/14/14 20:25	1
Diethyl phthalate	ND		0.95	0.14	ug/L		10/12/14 16:13	10/14/14 20:25	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		10/12/14 16:13	10/14/14 20:25	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		10/12/14 16:13	10/14/14 20:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*61*		*16 - 122*	*10/12/14 16:13*	*10/14/14 20:25*	*1*
2-Fluorobiphenyl	*62*		*19 - 107*	*10/12/14 16:13*	*10/14/14 20:25*	*1*
2-Fluorophenol (Surr)	*56*		*10 - 111*	*10/12/14 16:13*	*10/14/14 20:25*	*1*
Nitrobenzene-d5 (Surr)	*60*		*23 - 112*	*10/12/14 16:13*	*10/14/14 20:25*	*1*
Phenol-d5 (Surr)	*54*		*15 - 112*	*10/12/14 16:13*	*10/14/14 20:25*	*1*
Terphenyl-d14	*87*		*10 - 132*	*10/12/14 16:13*	*10/14/14 20:25*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		2.5	0.49	mg/L			10/14/14 01:17	2.5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.9**	**J**	10	3.0	ug/L		10/12/14 08:12	10/13/14 16:26	1
Iron	ND		50	9.5	ug/L		10/12/14 08:12	10/13/14 16:26	1
Nickel	**0.96**	**J**	10	0.51	ug/L		10/12/14 08:12	10/13/14 16:26	1
Zinc	**31**		10	1.0	ug/L		10/12/14 08:12	10/13/14 16:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.0059**	**J**	0.010	0.0050	mg/L		10/14/14 16:00	10/15/14 09:37	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/14/14 14:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/13/14 15:14	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-69112-1	FRAC 1 101014	61	62	56	60	54	87		
LCS 180-121186/2-A	Lab Control Sample	92	82	84	87	81	88		
LCSD 180-121186/3-A	Lab Control Sample Dup	87	75	74	81	72	83		
MB 180-121186/1-A	Method Blank	76	72	79	79	78	81		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-121186/1-A
Matrix: Water
Analysis Batch: 121363

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 121186

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/12/14 16:13	10/14/14 11:07	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/12/14 16:13	10/14/14 11:07	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/12/14 16:13	10/14/14 11:07	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/12/14 16:13	10/14/14 11:07	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/12/14 16:13	10/14/14 11:07	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/12/14 16:13	10/14/14 11:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*	*10/12/14 16:13*	*10/14/14 11:07*	*1*
2-Fluorobiphenyl	*72*		*19 - 107*	*10/12/14 16:13*	*10/14/14 11:07*	*1*
2-Fluorophenol (Surr)	*79*		*10 - 111*	*10/12/14 16:13*	*10/14/14 11:07*	*1*
Nitrobenzene-d5 (Surr)	*79*		*23 - 112*	*10/12/14 16:13*	*10/14/14 11:07*	*1*
Phenol-d5 (Surr)	*78*		*15 - 112*	*10/12/14 16:13*	*10/14/14 11:07*	*1*
Terphenyl-d14	*81*		*10 - 132*	*10/12/14 16:13*	*10/14/14 11:07*	*1*

Lab Sample ID: LCS 180-121186/2-A
Matrix: Water
Analysis Batch: 121363

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 121186

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	19.2		ug/L		96	20 - 116
Butyl benzyl phthalate	20.0	19.4		ug/L		97	36 - 108
Di-n-butyl phthalate	20.0	19.2		ug/L		96	37 - 111
Diethyl phthalate	20.0	19.6		ug/L		98	36 - 109
Dimethyl phthalate	20.0	18.6		ug/L		93	37 - 106
Di-n-octyl phthalate	20.0	19.4		ug/L		97	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*92*		*16 - 122*
2-Fluorobiphenyl	*82*		*19 - 107*
2-Fluorophenol (Surr)	*84*		*10 - 111*
Nitrobenzene-d5 (Surr)	*87*		*23 - 112*
Phenol-d5 (Surr)	*81*		*15 - 112*
Terphenyl-d14	*88*		*10 - 132*

Lab Sample ID: LCSD 180-121186/3-A
Matrix: Water
Analysis Batch: 121363

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 121186

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	18.2		ug/L		91	20 - 116	5	40
Butyl benzyl phthalate	20.0	18.5		ug/L		93	36 - 108	4	40
Di-n-butyl phthalate	20.0	17.7		ug/L		89	37 - 111	8	38
Diethyl phthalate	20.0	18.5		ug/L		92	36 - 109	6	39
Dimethyl phthalate	20.0	17.3		ug/L		87	37 - 106	7	42
Di-n-octyl phthalate	20.0	18.5		ug/L		92	11 - 127	5	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-121186/3-A
Matrix: Water
Analysis Batch: 121363

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 121186

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*16 - 122*
2-Fluorobiphenyl	*75*		*19 - 107*
2-Fluorophenol (Surr)	*74*		*10 - 111*
Nitrobenzene-d5 (Surr)	*81*		*23 - 112*
Phenol-d5 (Surr)	*72*		*15 - 112*
Terphenyl-d14	*83*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-121227/44
Matrix: Water
Analysis Batch: 121227

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/13/14 18:28	1

Lab Sample ID: LCS 180-121227/43
Matrix: Water
Analysis Batch: 121227

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.4		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-121170/1-A
Matrix: Water
Analysis Batch: 121314

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 121170

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/12/14 08:12	10/13/14 15:20	1
Iron	ND		50	9.5	ug/L		10/12/14 08:12	10/13/14 15:20	1
Nickel	ND		10	0.51	ug/L		10/12/14 08:12	10/13/14 15:20	1
Zinc	ND		10	1.0	ug/L		10/12/14 08:12	10/13/14 15:20	1

Lab Sample ID: LCS 180-121170/2-A
Matrix: Water
Analysis Batch: 121314

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 121170

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	545		ug/L		109	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	512		ug/L		102	85 - 115
Zinc	500	512		ug/L		102	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-207713/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207900 — **Prep Batch: 207713**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/14/14 16:00	10/15/14 08:30	1

Lab Sample ID: LCS 480-207713/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207900 — **Prep Batch: 207713**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.102		mg/L		102	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-207483/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207483

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/13/14 15:14	1

Lab Sample ID: LCS 480-207483/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	264	248		mg/L		94	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-207708/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207708

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/14/14 14:25	1

Lab Sample ID: LCS 480-207708/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207708

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.880		mg/L		96	90 - 110

Lab Sample ID: 480-69112-1 DU — **Client Sample ID: FRAC 1 101014**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207708

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

GC/MS Semi VOA

Prep Batch: 121186

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	3520C	
LCS 180-121186/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-121186/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-121186/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 121363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	8270C LL	121186
LCS 180-121186/2-A	Lab Control Sample	Total/NA	Water	8270C LL	121186
LCSD 180-121186/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	121186
MB 180-121186/1-A	Method Blank	Total/NA	Water	8270C LL	121186

HPLC/IC

Analysis Batch: 121227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	300.0	
LCS 180-121227/43	Lab Control Sample	Total/NA	Water	300.0	
MB 180-121227/44	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 121170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total Recoverable	Water	200.7	
LCS 180-121170/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-121170/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 121314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total Recoverable	Water	200.7 Rev 4.4	121170
LCS 180-121170/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	121170
MB 180-121170/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	121170

General Chemistry

Analysis Batch: 207483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	SM 2540D	
LCS 480-207483/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-207483/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 207708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	SM 4500 Cl G	
480-69112-1 DU	FRAC 1 101014	Total/NA	Water	SM 4500 Cl G	
LCS 480-207708/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-207708/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

General Chemistry (Continued)

Prep Batch: 207713

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	Distill/Phenol	
LCS 480-207713/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-207713/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 207900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69112-1	FRAC 1 101014	Total/NA	Water	420.4	207713
LCS 480-207713/2-A	Lab Control Sample	Total/NA	Water	420.4	207713
MB 480-207713/1-A	Method Blank	Total/NA	Water	420.4	207713

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Client Sample ID: FRAC 1 101014
Date Collected: 10/10/14 10:10
Date Received: 10/11/14 02:00

Lab Sample ID: 480-69112-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			121186	10/12/14 16:13	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	121363	10/14/14 20:25	VVP	TAL PIT
Total/NA	Analysis	300.0		2.5	121227	10/14/14 01:17	CMR	TAL PIT
Total Recoverable	Prep	200.7			121170	10/12/14 08:12	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	121314	10/13/14 16:26	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			207713	10/14/14 16:00	MRF	TAL BUF
Total/NA	Analysis	420.4		1	207900	10/15/14 09:37	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	207483	10/13/14 15:14	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	207708	10/14/14 14:25	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69112-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-69112-1	FRAC 1 101014	Water	10/10/14 10:10	10/11/14 02:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L JOHNSON	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC 1- 101014	10.10.14	1010	G	Water			X		X	X	X	X	X		
				Water											

480-69112 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 10.10.14	Company	Received by:	Date/Time: 10-10-14 1100	Company TA
Relinquished by:	Date/Time: 10-10-14 1635	Company	Received by:	Date/Time: 10/11/14 0200	Company TA
Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.0 #1

10/15/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69112-1

Login Number: 69112

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OLIN
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69112-1

Login Number: 69112
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/11/14 12:01 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-69501-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/22/2014 1:37:33 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-69501-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/17/2014 at 2:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 3.0º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample(s) was received outside of holding time: OC FRAC 1 101514 (480-69501-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Client Sample ID: OC FRAC 1 101514

Lab Sample ID: 480-69501-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		5.0	0.98	mg/L	5		300.0	Total/NA
Zinc	13		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Client Sample ID: OC FRAC 1 101514
Date Collected: 10/15/14 14:00
Date Received: 10/17/14 02:10

Lab Sample ID: 480-69501-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/17/14 11:17	10/20/14 13:16	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		10/17/14 11:17	10/20/14 13:16	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		10/17/14 11:17	10/20/14 13:16	1
Diethyl phthalate	ND		0.95	0.14	ug/L		10/17/14 11:17	10/20/14 13:16	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		10/17/14 11:17	10/20/14 13:16	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		10/17/14 11:17	10/20/14 13:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*	*10/17/14 11:17*	*10/20/14 13:16*	*1*
2-Fluorobiphenyl	*70*		*19 - 107*	*10/17/14 11:17*	*10/20/14 13:16*	*1*
2-Fluorophenol (Surr)	*64*		*10 - 111*	*10/17/14 11:17*	*10/20/14 13:16*	*1*
Nitrobenzene-d5 (Surr)	*76*		*23 - 112*	*10/17/14 11:17*	*10/20/14 13:16*	*1*
Phenol-d5 (Surr)	*65*		*15 - 112*	*10/17/14 11:17*	*10/20/14 13:16*	*1*
Terphenyl-d14	*97*		*10 - 132*	*10/17/14 11:17*	*10/20/14 13:16*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		5.0	0.98	mg/L			10/17/14 21:51	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/19/14 06:12	10/20/14 16:23	1
Iron	ND		50	9.5	ug/L		10/19/14 06:12	10/20/14 16:23	1
Nickel	ND		10	0.51	ug/L		10/19/14 06:12	10/20/14 16:23	1
Zinc	**13**		10	1.0	ug/L		10/19/14 06:12	10/20/14 16:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/17/14 13:15	10/20/14 09:59	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/18/14 09:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/21/14 10:51	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-69501-1	OC FRAC 1 101514	75	70	64	76	65	97		
LCS 180-121838/2-A	Lab Control Sample	67	61	67	66	65	66		
LCSD 180-121838/3-A	Lab Control Sample Dup	67	62	65	68	65	65		
MB 180-121838/1-A	Method Blank	69	65	65	70	66	65		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-121838/1-A
Matrix: Water
Analysis Batch: 122005

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 121838

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/17/14 11:17	10/20/14 10:31	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/17/14 11:17	10/20/14 10:31	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/17/14 11:17	10/20/14 10:31	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/17/14 11:17	10/20/14 10:31	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/17/14 11:17	10/20/14 10:31	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/17/14 11:17	10/20/14 10:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*69*		*16 - 122*	*10/17/14 11:17*	*10/20/14 10:31*	*1*
2-Fluorobiphenyl	*65*		*19 - 107*	*10/17/14 11:17*	*10/20/14 10:31*	*1*
2-Fluorophenol (Surr)	*65*		*10 - 111*	*10/17/14 11:17*	*10/20/14 10:31*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*10/17/14 11:17*	*10/20/14 10:31*	*1*
Phenol-d5 (Surr)	*66*		*15 - 112*	*10/17/14 11:17*	*10/20/14 10:31*	*1*
Terphenyl-d14	*65*		*10 - 132*	*10/17/14 11:17*	*10/20/14 10:31*	*1*

Lab Sample ID: LCS 180-121838/2-A
Matrix: Water
Analysis Batch: 122005

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 121838

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.3		ug/L		71	20 - 116
Butyl benzyl phthalate	20.0	14.0		ug/L		70	36 - 108
Di-n-butyl phthalate	20.0	13.6		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.9		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.7		ug/L		68	37 - 106
Di-n-octyl phthalate	20.0	13.5		ug/L		68	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*61*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Lab Sample ID: LCSD 180-121838/3-A
Matrix: Water
Analysis Batch: 122005

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 121838

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.1		ug/L		70	20 - 116	1	40
Butyl benzyl phthalate	20.0	13.8		ug/L		69	36 - 108	2	40
Di-n-butyl phthalate	20.0	13.7		ug/L		68	37 - 111	1	38
Diethyl phthalate	20.0	14.0		ug/L		70	36 - 109	1	39
Dimethyl phthalate	20.0	13.5		ug/L		68	37 - 106	1	42
Di-n-octyl phthalate	20.0	13.7		ug/L		68	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-121838/3-A
Matrix: Water
Analysis Batch: 122005

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 121838

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*62*		*19 - 107*
2-Fluorophenol (Surr)	*65*		*10 - 111*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*65*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-121807/6
Matrix: Water
Analysis Batch: 121807

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/17/14 10:58	1

Lab Sample ID: LCS 180-121807/5
Matrix: Water
Analysis Batch: 121807

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.3		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-121926/1-A
Matrix: Water
Analysis Batch: 122106

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 121926

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/19/14 06:12	10/20/14 16:13	1
Iron	15.0	J	50	9.5	ug/L		10/19/14 06:12	10/20/14 16:13	1
Nickel	ND		10	0.51	ug/L		10/19/14 06:12	10/20/14 16:13	1
Zinc	ND		10	1.0	ug/L		10/19/14 06:12	10/20/14 16:13	1

Lab Sample ID: LCS 180-121926/2-A
Matrix: Water
Analysis Batch: 122106

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 121926

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	523		ug/L		105	85 - 115
Iron	1000	974		ug/L		97	85 - 115
Nickel	500	490		ug/L		98	85 - 115
Zinc	500	474		ug/L		95	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-208457/1-A
Matrix: Water
Analysis Batch: 208820

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 208457

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/17/14 13:15	10/20/14 08:50	1

Lab Sample ID: LCS 480-208457/2-A
Matrix: Water
Analysis Batch: 208820

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 208457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.108		mg/L		108	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-209029/1
Matrix: Water
Analysis Batch: 209029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/21/14 10:51	1

Lab Sample ID: LCS 480-209029/2
Matrix: Water
Analysis Batch: 209029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	258	247		mg/L		96	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-208651/3
Matrix: Water
Analysis Batch: 208651

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/18/14 09:20	1

Lab Sample ID: LCS 480-208651/4
Matrix: Water
Analysis Batch: 208651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.930		mg/L		101	90 - 110

Lab Sample ID: 480-69501-1 DU
Matrix: Water
Analysis Batch: 208651

Client Sample ID: OC FRAC 1 101514
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

GC/MS Semi VOA

Prep Batch: 121838

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	3520C	
LCS 180-121838/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-121838/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-121838/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 122005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	8270C LL	121838
LCS 180-121838/2-A	Lab Control Sample	Total/NA	Water	8270C LL	121838
LCSD 180-121838/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	121838
MB 180-121838/1-A	Method Blank	Total/NA	Water	8270C LL	121838

HPLC/IC

Analysis Batch: 121807

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	300.0	
LCS 180-121807/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-121807/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 121926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total Recoverable	Water	200.7	
LCS 180-121926/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-121926/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 122106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total Recoverable	Water	200.7 Rev 4.4	121926
LCS 180-121926/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	121926
MB 180-121926/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	121926

General Chemistry

Prep Batch: 208457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	Distill/Phenol	
LCS 480-208457/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-208457/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 208651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	SM 4500 Cl G	
480-69501-1 DU	OC FRAC 1 101514	Total/NA	Water	SM 4500 Cl G	
LCS 480-208651/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-208651/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

General Chemistry (Continued)

Analysis Batch: 208820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	420.4	208457
LCS 480-208457/2-A	Lab Control Sample	Total/NA	Water	420.4	208457
MB 480-208457/1-A	Method Blank	Total/NA	Water	420.4	208457

Analysis Batch: 209029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69501-1	OC FRAC 1 101514	Total/NA	Water	SM 2540D	
LCS 480-209029/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-209029/1	Method Blank	Total/NA	Water	SM 2540D	

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Client Sample ID: OC FRAC 1 101514
Date Collected: 10/15/14 14:00
Date Received: 10/17/14 02:10

Lab Sample ID: 480-69501-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			121838	10/17/14 11:17	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	122005	10/20/14 13:16	VVP	TAL PIT
Total/NA	Analysis	300.0		5	121807	10/17/14 21:51	MJH	TAL PIT
Total Recoverable	Prep	200.7			121926	10/19/14 06:12	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	122106	10/20/14 16:23	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			208457	10/17/14 13:15	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	208820	10/20/14 09:59	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	209029	10/21/14 10:51	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	208651	10/18/14 09:20	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69501-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-69501-1	OC FRAC 1 101514	Water	10/15/14 14:00	10/17/14 02:10

TestAmerica Boston
240 Bea
Waltham
Phone (

480-69501 Chain of Custody

Chain of Custody Record

TestAmerica

Client
Client Cc
Mr. Brian

Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1

Company: Olin Corporation

Address: 51 Eames street
City: Wilmington
State, Zip: MA, 01887
Phone: 978 658 6121
Email: beguichard@olin.com
Project Name: Wilmington Plant B RPG
Site: WILMINGTON MA

Due Date Requested:
TAT Requested (days): A.S.A.P.
PO #: REWI0020
WO #:
Project #: 48006853
SSOW#:

Job #:

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC 1 - 101514	10-15-14	1400	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 10-16-14	Company	Received by: Date/Time: 10-16-14 1100 Company TAL
Relinquished by:	Date/Time: 10-16-14 1830	Company	Received by: Date/Time: 10/17/14 0210 Company TA
Relinquished by:	Date/Time:	Company	Received by: Date/Time: Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 3.0 #1

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10/22/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69501-1

Login Number: 69501

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69501-1

Login Number: 69501
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/17/14 12:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-69611-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/23/2014 2:46:47 PM
Rich Emerich, Analyst V
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Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-69611-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/18/2014 at 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC-FRAC 2-101714 (480-69611-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Client Sample ID: OC-FRAC 2-101714

Lab Sample ID: 480-69611-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	5.4	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	15		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Client Sample ID: OC-FRAC 2-101714
Date Collected: 10/17/14 10:30
Date Received: 10/18/14 02:10

Lab Sample ID: 480-69611-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/20/14 11:27	10/21/14 17:16	1
Butyl benzyl phthalate	ND		0.95	0.14	ug/L		10/20/14 11:27	10/21/14 17:16	1
Di-n-butyl phthalate	ND		0.95	0.12	ug/L		10/20/14 11:27	10/21/14 17:16	1
Diethyl phthalate	ND		0.95	0.14	ug/L		10/20/14 11:27	10/21/14 17:16	1
Dimethyl phthalate	ND		0.95	0.073	ug/L		10/20/14 11:27	10/21/14 17:16	1
Di-n-octyl phthalate	ND		0.95	0.20	ug/L		10/20/14 11:27	10/21/14 17:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*66*		*16 - 122*	*10/20/14 11:27*	*10/21/14 17:16*	*1*
2-Fluorobiphenyl	*61*		*19 - 107*	*10/20/14 11:27*	*10/21/14 17:16*	*1*
2-Fluorophenol (Surr)	*55*		*10 - 111*	*10/20/14 11:27*	*10/21/14 17:16*	*1*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*	*10/20/14 11:27*	*10/21/14 17:16*	*1*
Phenol-d5 (Surr)	*55*		*15 - 112*	*10/20/14 11:27*	*10/21/14 17:16*	*1*
Terphenyl-d14	*58*		*10 - 132*	*10/20/14 11:27*	*10/21/14 17:16*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		5.0	0.98	mg/L			10/18/14 12:37	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.4**	**J**	10	3.0	ug/L		10/19/14 06:12	10/20/14 16:28	1
Iron	ND		50	9.5	ug/L		10/19/14 06:12	10/20/14 16:28	1
Nickel	ND		10	0.51	ug/L		10/19/14 06:12	10/20/14 16:28	1
Zinc	**15**		10	1.0	ug/L		10/19/14 06:12	10/20/14 16:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/21/14 09:30	10/23/14 09:31	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/18/14 09:20	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/21/14 10:51	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-69611-1	OC-FRAC 2-101714	66	61	55	66	55	58		
LCS 180-122047/2-A	Lab Control Sample	70	64	67	70	69	70		
LCSD 180-122047/3-A	Lab Control Sample Dup	68	64	68	70	69	70		
MB 180-122047/1-A	Method Blank	72	64	67	68	67	68		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-122047/1-A
Matrix: Water
Analysis Batch: 122210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 122047

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/20/14 11:27	10/21/14 11:51	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/20/14 11:27	10/21/14 11:51	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/20/14 11:27	10/21/14 11:51	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/20/14 11:27	10/21/14 11:51	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/20/14 11:27	10/21/14 11:51	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/20/14 11:27	10/21/14 11:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*72*		*16 - 122*	*10/20/14 11:27*	*10/21/14 11:51*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*10/20/14 11:27*	*10/21/14 11:51*	*1*
2-Fluorophenol (Surr)	*67*		*10 - 111*	*10/20/14 11:27*	*10/21/14 11:51*	*1*
Nitrobenzene-d5 (Surr)	*68*		*23 - 112*	*10/20/14 11:27*	*10/21/14 11:51*	*1*
Phenol-d5 (Surr)	*67*		*15 - 112*	*10/20/14 11:27*	*10/21/14 11:51*	*1*
Terphenyl-d14	*68*		*10 - 132*	*10/20/14 11:27*	*10/21/14 11:51*	*1*

Lab Sample ID: LCS 180-122047/2-A
Matrix: Water
Analysis Batch: 122210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 122047

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		77	20 - 116
Butyl benzyl phthalate	20.0	15.1		ug/L		76	36 - 108
Di-n-butyl phthalate	20.0	14.5		ug/L		73	37 - 111
Diethyl phthalate	20.0	14.7		ug/L		74	36 - 109
Dimethyl phthalate	20.0	13.9		ug/L		70	37 - 106
Di-n-octyl phthalate	20.0	14.5		ug/L		73	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*67*		*10 - 111*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*70*		*10 - 132*

Lab Sample ID: LCSD 180-122047/3-A
Matrix: Water
Analysis Batch: 122210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122047

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		76	20 - 116	0	40
Butyl benzyl phthalate	20.0	15.1		ug/L		76	36 - 108	0	40
Di-n-butyl phthalate	20.0	14.4		ug/L		72	37 - 111	1	38
Diethyl phthalate	20.0	14.7		ug/L		74	36 - 109	0	39
Dimethyl phthalate	20.0	14.1		ug/L		71	37 - 106	1	42
Di-n-octyl phthalate	20.0	14.3		ug/L		72	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-122047/3-A
Matrix: Water
Analysis Batch: 122210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122047

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*
2-Fluorobiphenyl	*64*		*19 - 107*
2-Fluorophenol (Surr)	*68*		*10 - 111*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*70*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-121807/54
Matrix: Water
Analysis Batch: 121807

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/17/14 23:54	1

Lab Sample ID: LCS 180-121807/53
Matrix: Water
Analysis Batch: 121807

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.0		mg/L		102	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-121926/1-A
Matrix: Water
Analysis Batch: 122106

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 121926

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/19/14 06:12	10/20/14 16:13	1
Iron	15.0	J	50	9.5	ug/L		10/19/14 06:12	10/20/14 16:13	1
Nickel	ND		10	0.51	ug/L		10/19/14 06:12	10/20/14 16:13	1
Zinc	ND		10	1.0	ug/L		10/19/14 06:12	10/20/14 16:13	1

Lab Sample ID: LCS 180-121926/2-A
Matrix: Water
Analysis Batch: 122106

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 121926

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	523		ug/L		105	85 - 115
Iron	1000	974		ug/L		97	85 - 115
Nickel	500	490		ug/L		98	85 - 115
Zinc	500	474		ug/L		95	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-209076/1-A
Matrix: Water
Analysis Batch: 209571

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 209076

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/21/14 09:30	10/23/14 08:45	1

Lab Sample ID: LCS 480-209076/2-A
Matrix: Water
Analysis Batch: 209571

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 209076

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0993		mg/L		99	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-209029/1
Matrix: Water
Analysis Batch: 209029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/21/14 10:51	1

Lab Sample ID: LCS 480-209029/2
Matrix: Water
Analysis Batch: 209029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	258	247		mg/L		96	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-208651/3
Matrix: Water
Analysis Batch: 208651

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/18/14 09:20	1

Lab Sample ID: LCS 480-208651/4
Matrix: Water
Analysis Batch: 208651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.930		mg/L		101	90 - 110

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

GC/MS Semi VOA

Prep Batch: 122047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	3520C	
LCS 180-122047/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-122047/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-122047/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 122210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	8270C LL	122047
LCS 180-122047/2-A	Lab Control Sample	Total/NA	Water	8270C LL	122047
LCSD 180-122047/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	122047
MB 180-122047/1-A	Method Blank	Total/NA	Water	8270C LL	122047

HPLC/IC

Analysis Batch: 121807

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	300.0	
LCS 180-121807/53	Lab Control Sample	Total/NA	Water	300.0	
MB 180-121807/54	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 121926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total Recoverable	Water	200.7	
LCS 180-121926/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-121926/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 122106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total Recoverable	Water	200.7 Rev 4.4	121926
LCS 180-121926/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	121926
MB 180-121926/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	121926

General Chemistry

Analysis Batch: 208651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	SM 4500 Cl G	
LCS 480-208651/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-208651/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 209029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	SM 2540D	
LCS 480-209029/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-209029/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 209076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	Distill/Phenol	
LCS 480-209076/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-209076/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 209571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69611-1	OC-FRAC 2-101714	Total/NA	Water	420.4	209076
LCS 480-209076/2-A	Lab Control Sample	Total/NA	Water	420.4	209076
MB 480-209076/1-A	Method Blank	Total/NA	Water	420.4	209076

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Client Sample ID: OC-FRAC 2-101714 — **Lab Sample ID: 480-69611-1**
Date Collected: 10/17/14 10:30 — **Matrix: Water**
Date Received: 10/18/14 02:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			122047	10/20/14 11:27	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	122210	10/21/14 17:16	VVP	TAL PIT
Total/NA	Analysis	300.0		5	121807	10/18/14 12:37	MJH	TAL PIT
Total Recoverable	Prep	200.7			121926	10/19/14 06:12	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	122106	10/20/14 16:28	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			209076	10/21/14 09:30	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	209571	10/23/14 09:31	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	209029	10/21/14 10:51	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	208651	10/18/14 09:20	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-14 *
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69611-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-69611-1	OC-FRAC 2-101714	Water	10/17/14 10:30	10/18/14 02:10

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:	Analysis Requested		Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3
City: Wilmington	TAT Requested (days): A. S. A. P.			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG F2	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

480-69611 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Num	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
FRAC2 - 101719	10-17-19	1030	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	L Johnson	10-17-19			10-17-19 1100	T&T
2		10-17-19 1630			10/18/19 0200	T/A
3		Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.3 #1

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69611-1

Login Number: 69611

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69611-1

Login Number: 69611
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/18/14 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-69768-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/28/2014 4:47:28 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Job ID: 480-69768-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/22/2014 at 1:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.0º C.

Receipt Exceptions
Pursuant to notification received from the client, this sample was collected on 10/2120/14: the Chain of Custody (COC) form lists an incorrect date.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC-INF-102114 (480-69768-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 122414.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Client Sample ID: OC-INF-102114

Lab Sample ID: 480-69768-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bis(2-ethylhexyl) phthalate	82	E	1.9	1.2	ug/L	1		8270C LL	Total/NA
Bis(2-ethylhexyl) phthalate - DL	65		9.4	5.9	ug/L	5		8270C LL	Total/NA
Chloride	200		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	16		10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Iron	19000		50	9.5	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	3.3	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	13		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Phenolics, Total Recoverable	0.041		0.010	0.0050	mg/L	1		420.4	Total/NA
Chlorine, Total Residual	0.010	J HF	0.020	0.010	mg/L	1		SM 4500 Cl G	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	14		4.0	4.0	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: OC-INF-102114

Date Collected: 10/21/14 11:10
Date Received: 10/22/14 01:30

Lab Sample ID: 480-69768-1

Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**82**	**E**	1.9	1.2	ug/L		10/22/14 15:07	10/23/14 15:24	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		10/22/14 15:07	10/23/14 15:24	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/22/14 15:07	10/23/14 15:24	1
Diethyl phthalate	ND		0.94	0.14	ug/L		10/22/14 15:07	10/23/14 15:24	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/22/14 15:07	10/23/14 15:24	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/22/14 15:07	10/23/14 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*53*		*16 - 122*	*10/22/14 15:07*	*10/23/14 15:24*	*1*
2-Fluorobiphenyl	*53*		*19 - 107*	*10/22/14 15:07*	*10/23/14 15:24*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 111*	*10/22/14 15:07*	*10/23/14 15:24*	*1*
Nitrobenzene-d5 (Surr)	*61*		*23 - 112*	*10/22/14 15:07*	*10/23/14 15:24*	*1*
Phenol-d5 (Surr)	*42*		*15 - 112*	*10/22/14 15:07*	*10/23/14 15:24*	*1*
Terphenyl-d14	*37*		*10 - 132*	*10/22/14 15:07*	*10/23/14 15:24*	*1*

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	**65**		9.4	5.9	ug/L		10/22/14 15:07	10/24/14 18:39	5
Butyl benzyl phthalate	ND		4.7	0.67	ug/L		10/22/14 15:07	10/24/14 18:39	5
Di-n-butyl phthalate	ND		4.7	0.59	ug/L		10/22/14 15:07	10/24/14 18:39	5
Diethyl phthalate	ND		4.7	0.69	ug/L		10/22/14 15:07	10/24/14 18:39	5
Dimethyl phthalate	ND		4.7	0.36	ug/L		10/22/14 15:07	10/24/14 18:39	5
Di-n-octyl phthalate	ND		4.7	0.97	ug/L		10/22/14 15:07	10/24/14 18:39	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*43*		*16 - 122*	*10/22/14 15:07*	*10/24/14 18:39*	*5*
2-Fluorobiphenyl	*52*		*19 - 107*	*10/22/14 15:07*	*10/24/14 18:39*	*5*
2-Fluorophenol (Surr)	*42*		*10 - 111*	*10/22/14 15:07*	*10/24/14 18:39*	*5*
Nitrobenzene-d5 (Surr)	*56*		*23 - 112*	*10/22/14 15:07*	*10/24/14 18:39*	*5*
Phenol-d5 (Surr)	*40*		*15 - 112*	*10/22/14 15:07*	*10/24/14 18:39*	*5*
Terphenyl-d14	*35*		*10 - 132*	*10/22/14 15:07*	*10/24/14 18:39*	*5*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		5.0	0.98	mg/L			10/22/14 18:39	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**16**		10	3.0	ug/L		10/23/14 04:32	10/24/14 16:22	1
Iron	**19000**		50	9.5	ug/L		10/23/14 04:32	10/24/14 16:22	1
Nickel	**3.3**	**J**	10	0.51	ug/L		10/23/14 04:32	10/24/14 16:22	1
Zinc	**13**		10	1.0	ug/L		10/23/14 04:32	10/24/14 16:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	**0.041**		0.010	0.0050	mg/L		10/23/14 09:45	10/28/14 11:21	1
Chlorine, Total Residual	**0.010**	**J HF**	0.020	0.010	mg/L			10/22/14 13:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**14**		4.0	4.0	mg/L			10/22/14 16:53	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-69768-1	OC-INF-102114	53	53	49	61	42	37		
480-69768-1 - DL	OC-INF-102114	43	52	42	56	40	35		
LCS 180-122414/2-A	Lab Control Sample	78	68	72	72	64	68		
LCSD 180-122414/3-A	Lab Control Sample Dup	76	68	73	72	65	67		
MB 180-122414/1-A	Method Blank	75	68	77	72	68	69		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-122414/1-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 122414

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/22/14 15:07	10/23/14 12:21	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/22/14 15:07	10/23/14 12:21	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/22/14 15:07	10/23/14 12:21	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/22/14 15:07	10/23/14 12:21	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/22/14 15:07	10/23/14 12:21	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/22/14 15:07	10/23/14 12:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
2-Fluorobiphenyl	*68*		*19 - 107*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
2-Fluorophenol (Surr)	*77*		*10 - 111*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Phenol-d5 (Surr)	*68*		*15 - 112*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Terphenyl-d14	*69*		*10 - 132*	*10/22/14 15:07*	*10/23/14 12:21*	*1*

Lab Sample ID: LCS 180-122414/2-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 122414

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.2		ug/L		76	20 - 116
Butyl benzyl phthalate	20.0	14.6		ug/L		73	36 - 108
Di-n-butyl phthalate	20.0	14.4		ug/L		72	37 - 111
Diethyl phthalate	20.0	13.9		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.6		ug/L		68	37 - 106
Di-n-octyl phthalate	20.0	13.6		ug/L		68	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*78*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*64*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Lab Sample ID: LCSD 180-122414/3-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122414

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		76	20 - 116	1	40
Butyl benzyl phthalate	20.0	14.7		ug/L		74	36 - 108	1	40
Di-n-butyl phthalate	20.0	14.5		ug/L		73	37 - 111	1	38
Diethyl phthalate	20.0	14.1		ug/L		71	36 - 109	2	39
Dimethyl phthalate	20.0	13.7		ug/L		68	37 - 106	0	42
Di-n-octyl phthalate	20.0	13.7		ug/L		68	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-122414/3-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122414

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*73*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*67*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-122363/6
Matrix: Water
Analysis Batch: 122363

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/22/14 09:35	1

Lab Sample ID: LCS 180-122363/5
Matrix: Water
Analysis Batch: 122363

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.6		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-122439/1-A
Matrix: Water
Analysis Batch: 122762

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/23/14 04:32	10/24/14 16:12	1
Iron	ND		50	9.5	ug/L		10/23/14 04:32	10/24/14 16:12	1
Nickel	ND		10	0.51	ug/L		10/23/14 04:32	10/24/14 16:12	1
Zinc	ND		10	1.0	ug/L		10/23/14 04:32	10/24/14 16:12	1

Lab Sample ID: LCS 180-122439/2-A
Matrix: Water
Analysis Batch: 122762

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	526		ug/L		105	85 - 115
Iron	1000	977		ug/L		98	85 - 115
Nickel	500	508		ug/L		102	85 - 115
Zinc	500	494		ug/L		99	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 480-69768-1 MS
Matrix: Water
Analysis Batch: 122762

Client Sample ID: OC-INF-102114
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	16		500	558		ug/L		108	70 - 130
Iron	19000		1000	21700	4	ug/L		274	70 - 130
Nickel	3.3	J	500	518		ug/L		103	70 - 130
Zinc	13		500	501		ug/L		98	70 - 130

Lab Sample ID: 480-69768-1 MSD
Matrix: Water
Analysis Batch: 122762

Client Sample ID: OC-INF-102114
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	16		500	545		ug/L		106	70 - 130	2	20
Iron	19000		1000	20600	4	ug/L		162	70 - 130	5	20
Nickel	3.3	J	500	504		ug/L		100	70 - 130	3	20
Zinc	13		500	491		ug/L		96	70 - 130	2	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-209611/1-A
Matrix: Water
Analysis Batch: 210495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 209611

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/23/14 09:45	10/28/14 11:21	1

Lab Sample ID: LCS 480-209611/2-A
Matrix: Water
Analysis Batch: 210495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 209611

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.106		mg/L		106	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-209386/1
Matrix: Water
Analysis Batch: 209386

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/22/14 16:53	1

Lab Sample ID: LCS 480-209386/2
Matrix: Water
Analysis Batch: 209386

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	262	235		mg/L		89	88 - 110

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 480-69768-1 DU
Matrix: Water
Analysis Batch: 209386

Client Sample ID: OC-INF-102114
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	14			21.2	F3	mg/L				38	15

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-209335/3
Matrix: Water
Analysis Batch: 209335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/22/14 13:00	1

Lab Sample ID: LCS 480-209335/4
Matrix: Water
Analysis Batch: 209335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chlorine, Total Residual			0.920	0.930		mg/L		101	90 - 110		

Lab Sample ID: 480-69768-1 DU
Matrix: Water
Analysis Batch: 209335

Client Sample ID: OC-INF-102114
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	0.010	J HF		0.0100	J	mg/L				0	20

GC/MS Semi VOA

Prep Batch: 122414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	3520C	
480-69768-1 - DL	OC-INF-102114	Total/NA	Water	3520C	
LCS 180-122414/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-122414/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-122414/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 122487

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	8270C LL	122414
LCS 180-122414/2-A	Lab Control Sample	Total/NA	Water	8270C LL	122414
LCSD 180-122414/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	122414
MB 180-122414/1-A	Method Blank	Total/NA	Water	8270C LL	122414

Analysis Batch: 122622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1 - DL	OC-INF-102114	Total/NA	Water	8270C LL	122414

HPLC/IC

Analysis Batch: 122363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	300.0	
LCS 180-122363/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-122363/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 122439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total Recoverable	Water	200.7	
480-69768-1 MS	OC-INF-102114	Total Recoverable	Water	200.7	
480-69768-1 MSD	OC-INF-102114	Total Recoverable	Water	200.7	
LCS 180-122439/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-122439/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 122762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total Recoverable	Water	200.7 Rev 4.4	122439
480-69768-1 MS	OC-INF-102114	Total Recoverable	Water	200.7 Rev 4.4	122439
480-69768-1 MSD	OC-INF-102114	Total Recoverable	Water	200.7 Rev 4.4	122439
LCS 180-122439/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	122439
MB 180-122439/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	122439

General Chemistry

Analysis Batch: 209335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	SM 4500 Cl G	
480-69768-1 DU	OC-INF-102114	Total/NA	Water	SM 4500 Cl G	
LCS 480-209335/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	

General Chemistry (Continued)

Analysis Batch: 209335 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-209335/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 209386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	SM 2540D	
480-69768-1 DU	OC-INF-102114	Total/NA	Water	SM 2540D	
LCS 480-209386/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-209386/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 209611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	Distill/Phenol	
LCS 480-209611/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-209611/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 210495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69768-1	OC-INF-102114	Total/NA	Water	420.4	209611
LCS 480-209611/2-A	Lab Control Sample	Total/NA	Water	420.4	209611
MB 480-209611/1-A	Method Blank	Total/NA	Water	420.4	209611

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Client Sample ID: OC-INF-102114
Date Collected: 10/21/14 11:10
Date Received: 10/22/14 01:30

Lab Sample ID: 480-69768-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			122414	10/22/14 15:07	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	122487	10/23/14 15:24	VVP	TAL PIT
Total/NA	Prep	3520C	DL		122414	10/22/14 15:07	BJT	TAL PIT
Total/NA	Analysis	8270C LL	DL	5	122622	10/24/14 18:39	VVP	TAL PIT
Total/NA	Analysis	300.0		5	122363	10/22/14 18:39	MJH	TAL PIT
Total Recoverable	Prep	200.7			122439	10/23/14 04:32	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	122762	10/24/14 16:22	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			209611	10/23/14 09:45	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	210495	10/28/14 11:21	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	209386	10/22/14 16:53	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	209335	10/22/14 13:00	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69768-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-69768-1	OC-INF-102114	Water	10/21/14 11:10	10/22/14 01:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation				Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

480-69768 Chain of Custody

Preservation Codes:
A - HCL
M - Hexane
L - EDA
Z - other (specify)
Other:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_CL_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of contain	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
INF. 102214	10-22-14	1110	G	Water			X		X	X	X	X	X		
				Water											

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
L Johnson	10-22-14		[signature]	10-22-14 1145	TA
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 10/22/14 0130	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.0 #1

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69768-1

Login Number: 69768

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OLIN CORP
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69768-1

Login Number: 69768
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/22/14 12:04 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-69769-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/28/2014 4:44:42 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Job ID: 480-69769-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/22/2014 at 1:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.0º C.

Receipt Exceptions
Pursuant to notification received from the client, this sample was collected on 10/2120/14: the Chain of Custody (COC) form lists an incorrect date.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC-FRAC 3-102114 (480-69769-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 122414.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Client Sample ID: OC-FRAC 3-102114

Lab Sample ID: 480-69769-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	260		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	4.2	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	7.4	J	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Client Sample ID: OC-FRAC 3-102114
Date Collected: 10/21/14 11:00
Date Received: 10/22/14 01:30

Lab Sample ID: 480-69769-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/22/14 15:07	10/23/14 15:50	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		10/22/14 15:07	10/23/14 15:50	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/22/14 15:07	10/23/14 15:50	1
Diethyl phthalate	ND		0.94	0.14	ug/L		10/22/14 15:07	10/23/14 15:50	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/22/14 15:07	10/23/14 15:50	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/22/14 15:07	10/23/14 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*16 - 122*	*10/22/14 15:07*	*10/23/14 15:50*	*1*
2-Fluorobiphenyl	*58*		*19 - 107*	*10/22/14 15:07*	*10/23/14 15:50*	*1*
2-Fluorophenol (Surr)	*57*		*10 - 111*	*10/22/14 15:07*	*10/23/14 15:50*	*1*
Nitrobenzene-d5 (Surr)	*66*		*23 - 112*	*10/22/14 15:07*	*10/23/14 15:50*	*1*
Phenol-d5 (Surr)	*54*		*15 - 112*	*10/22/14 15:07*	*10/23/14 15:50*	*1*
Terphenyl-d14	*68*		*10 - 132*	*10/22/14 15:07*	*10/23/14 15:50*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**260**		5.0	0.98	mg/L			10/22/14 18:55	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.2**	**J**	10	3.0	ug/L		10/23/14 04:32	10/24/14 16:51	1
Iron	ND		50	9.5	ug/L		10/23/14 04:32	10/24/14 16:51	1
Nickel	ND		10	0.51	ug/L		10/23/14 04:32	10/24/14 16:51	1
Zinc	**7.4**	**J**	10	1.0	ug/L		10/23/14 04:32	10/24/14 16:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/23/14 09:45	10/28/14 11:21	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/22/14 13:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/22/14 16:53	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-69769-1	OC-FRAC 3-102114	70	58	57	66	54	68		
LCS 180-122414/2-A	Lab Control Sample	78	68	72	72	64	68		
LCSD 180-122414/3-A	Lab Control Sample Dup	76	68	73	72	65	67		
MB 180-122414/1-A	Method Blank	75	68	77	72	68	69		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-122414/1-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 122414

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/22/14 15:07	10/23/14 12:21	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/22/14 15:07	10/23/14 12:21	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/22/14 15:07	10/23/14 12:21	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/22/14 15:07	10/23/14 12:21	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/22/14 15:07	10/23/14 12:21	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/22/14 15:07	10/23/14 12:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*75*		*16 - 122*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
2-Fluorobiphenyl	*68*		*19 - 107*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
2-Fluorophenol (Surr)	*77*		*10 - 111*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Phenol-d5 (Surr)	*68*		*15 - 112*	*10/22/14 15:07*	*10/23/14 12:21*	*1*
Terphenyl-d14	*69*		*10 - 132*	*10/22/14 15:07*	*10/23/14 12:21*	*1*

Lab Sample ID: LCS 180-122414/2-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 122414

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.2		ug/L		76	20 - 116
Butyl benzyl phthalate	20.0	14.6		ug/L		73	36 - 108
Di-n-butyl phthalate	20.0	14.4		ug/L		72	37 - 111
Diethyl phthalate	20.0	13.9		ug/L		69	36 - 109
Dimethyl phthalate	20.0	13.6		ug/L		68	37 - 106
Di-n-octyl phthalate	20.0	13.6		ug/L		68	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*78*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*64*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Lab Sample ID: LCSD 180-122414/3-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122414

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.3		ug/L		76	20 - 116	1	40
Butyl benzyl phthalate	20.0	14.7		ug/L		74	36 - 108	1	40
Di-n-butyl phthalate	20.0	14.5		ug/L		73	37 - 111	1	38
Diethyl phthalate	20.0	14.1		ug/L		71	36 - 109	2	39
Dimethyl phthalate	20.0	13.7		ug/L		68	37 - 106	0	42
Di-n-octyl phthalate	20.0	13.7		ug/L		68	11 - 127	1	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-122414/3-A
Matrix: Water
Analysis Batch: 122487

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122414

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*
2-Fluorobiphenyl	*68*		*19 - 107*
2-Fluorophenol (Surr)	*73*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*67*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-122363/6
Matrix: Water
Analysis Batch: 122363

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/22/14 09:35	1

Lab Sample ID: LCS 180-122363/5
Matrix: Water
Analysis Batch: 122363

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.6		mg/L		101	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-122439/1-A
Matrix: Water
Analysis Batch: 122762

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/23/14 04:32	10/24/14 16:12	1
Iron	ND		50	9.5	ug/L		10/23/14 04:32	10/24/14 16:12	1
Nickel	ND		10	0.51	ug/L		10/23/14 04:32	10/24/14 16:12	1
Zinc	ND		10	1.0	ug/L		10/23/14 04:32	10/24/14 16:12	1

Lab Sample ID: LCS 180-122439/2-A
Matrix: Water
Analysis Batch: 122762

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 122439

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	526		ug/L		105	85 - 115
Iron	1000	977		ug/L		98	85 - 115
Nickel	500	508		ug/L		102	85 - 115
Zinc	500	494		ug/L		99	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-209611/1-A
Matrix: Water
Analysis Batch: 210495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 209611

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/23/14 09:45	10/28/14 11:21	1

Lab Sample ID: LCS 480-209611/2-A
Matrix: Water
Analysis Batch: 210495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 209611

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.106		mg/L		106	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-209386/1
Matrix: Water
Analysis Batch: 209386

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/22/14 16:53	1

Lab Sample ID: LCS 480-209386/2
Matrix: Water
Analysis Batch: 209386

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	262	235		mg/L		89	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-209335/3
Matrix: Water
Analysis Batch: 209335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/22/14 13:00	1

Lab Sample ID: LCS 480-209335/4
Matrix: Water
Analysis Batch: 209335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.930		mg/L		101	90 - 110

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

GC/MS Semi VOA

Prep Batch: 122414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	3520C	
LCS 180-122414/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-122414/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-122414/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 122487

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	8270C LL	122414
LCS 180-122414/2-A	Lab Control Sample	Total/NA	Water	8270C LL	122414
LCSD 180-122414/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	122414
MB 180-122414/1-A	Method Blank	Total/NA	Water	8270C LL	122414

HPLC/IC

Analysis Batch: 122363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	300.0	
LCS 180-122363/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-122363/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 122439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total Recoverable	Water	200.7	
LCS 180-122439/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-122439/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 122762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total Recoverable	Water	200.7 Rev 4.4	122439
LCS 180-122439/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	122439
MB 180-122439/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	122439

General Chemistry

Analysis Batch: 209335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	SM 4500 Cl G	
LCS 480-209335/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-209335/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 209386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	SM 2540D	
LCS 480-209386/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-209386/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 209611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	Distill/Phenol	
LCS 480-209611/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-209611/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 210495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-69769-1	OC-FRAC 3-102114	Total/NA	Water	420.4	209611
LCS 480-209611/2-A	Lab Control Sample	Total/NA	Water	420.4	209611
MB 480-209611/1-A	Method Blank	Total/NA	Water	420.4	209611

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Client Sample ID: OC-FRAC 3-102114
Date Collected: 10/21/14 11:00
Date Received: 10/22/14 01:30

Lab Sample ID: 480-69769-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			122414	10/22/14 15:07	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	122487	10/23/14 15:50	VVP	TAL PIT
Total/NA	Analysis	300.0		5	122363	10/22/14 18:55	MJH	TAL PIT
Total Recoverable	Prep	200.7			122439	10/23/14 04:32	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	122762	10/24/14 16:51	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			209611	10/23/14 09:45	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	210495	10/28/14 11:21	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	209386	10/22/14 16:53	JMB	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	209335	10/22/14 13:00	NCH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-69769-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-69769-1	OC-FRAC 3-102114	Water	10/21/14 11:00	10/22/14 01:30

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation		Analysis Requested		Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG F3	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N		
FRAC3. 102214	10.22.14	1100	G	Water			X		X	X	X	X	X		
				Water											

480-69769 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10.22.14		[signature]	10-21-14 1145	JK
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/22/14 0130	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.0 #1

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69769-1

Login Number: 69769

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	OILIN CORP
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-69769-1

Login Number: 69769
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/22/14 12:04 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-70015-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/29/2014 2:39:05 PM
Rich Emerich, Analyst V
rich.emerich@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Job ID: 480-70015-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/24/2014 at 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.6º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: OC-FRAC 4-102314 (480-70015-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 122853.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Client Sample ID: OC-FRAC 4-102314

Lab Sample ID: 480-70015-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl phthalate	0.16	J	0.94	0.14	ug/L	1		8270C LL	Total/NA
Chloride	260		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	5.6	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	0.84	J	10	0.51	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	13	B	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Client Sample ID: OC-FRAC 4-102314
Date Collected: 10/23/14 10:00
Date Received: 10/24/14 02:00

Lab Sample ID: 480-70015-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/27/14 10:54	10/28/14 16:43	1
Butyl benzyl phthalate	ND		0.94	0.13	ug/L		10/27/14 10:54	10/28/14 16:43	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/27/14 10:54	10/28/14 16:43	1
Diethyl phthalate	**0.16**	**J**	0.94	0.14	ug/L		10/27/14 10:54	10/28/14 16:43	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/27/14 10:54	10/28/14 16:43	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/27/14 10:54	10/28/14 16:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*73*		*16 - 122*	*10/27/14 10:54*	*10/28/14 16:43*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*10/27/14 10:54*	*10/28/14 16:43*	*1*
2-Fluorophenol (Surr)	*49*		*10 - 111*	*10/27/14 10:54*	*10/28/14 16:43*	*1*
Nitrobenzene-d5 (Surr)	*64*		*23 - 112*	*10/27/14 10:54*	*10/28/14 16:43*	*1*
Phenol-d5 (Surr)	*50*		*15 - 112*	*10/27/14 10:54*	*10/28/14 16:43*	*1*
Terphenyl-d14	*75*		*10 - 132*	*10/27/14 10:54*	*10/28/14 16:43*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**260**		5.0	0.98	mg/L			10/26/14 19:09	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.6**	**J**	10	3.0	ug/L		10/27/14 06:26	10/29/14 11:57	1
Iron	ND		50	9.5	ug/L		10/27/14 06:26	10/29/14 11:57	1
Nickel	**0.84**	**J**	10	0.51	ug/L		10/27/14 06:26	10/29/14 11:57	1
Zinc	**13**	**B**	10	1.0	ug/L		10/27/14 06:26	10/29/14 11:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/27/14 13:00	10/28/14 09:28	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/25/14 09:40	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/28/14 12:47	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-70015-1	OC-FRAC 4-102314	73	64	49	64	50	75		
LCS 180-122853/2-A	Lab Control Sample	67	65	69	71	66	68		
LCSD 180-122853/3-A	Lab Control Sample Dup	71	66	69	72	65	69		
MB 180-122853/1-A	Method Blank	65	64	65	69	63	68		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-122853/1-A
Matrix: Water
Analysis Batch: 122959

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 122853

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/27/14 10:54	10/28/14 12:10	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/27/14 10:54	10/28/14 12:10	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/27/14 10:54	10/28/14 12:10	1
Diethyl phthalate	ND		1.0	0.15	ug/L		10/27/14 10:54	10/28/14 12:10	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/27/14 10:54	10/28/14 12:10	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/27/14 10:54	10/28/14 12:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*16 - 122*	*10/27/14 10:54*	*10/28/14 12:10*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*10/27/14 10:54*	*10/28/14 12:10*	*1*
2-Fluorophenol (Surr)	*65*		*10 - 111*	*10/27/14 10:54*	*10/28/14 12:10*	*1*
Nitrobenzene-d5 (Surr)	*69*		*23 - 112*	*10/27/14 10:54*	*10/28/14 12:10*	*1*
Phenol-d5 (Surr)	*63*		*15 - 112*	*10/27/14 10:54*	*10/28/14 12:10*	*1*
Terphenyl-d14	*68*		*10 - 132*	*10/27/14 10:54*	*10/28/14 12:10*	*1*

Lab Sample ID: LCS 180-122853/2-A
Matrix: Water
Analysis Batch: 122959

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 122853

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.3		ug/L		71	20 - 116
Butyl benzyl phthalate	20.0	13.9		ug/L		70	36 - 108
Di-n-butyl phthalate	20.0	13.1		ug/L		65	37 - 111
Diethyl phthalate	20.0	14.0		ug/L		70	36 - 109
Dimethyl phthalate	20.0	13.1		ug/L		65	37 - 106
Di-n-octyl phthalate	20.0	13.8		ug/L		69	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*
2-Fluorobiphenyl	*65*		*19 - 107*
2-Fluorophenol (Surr)	*69*		*10 - 111*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*
Phenol-d5 (Surr)	*66*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Lab Sample ID: LCSD 180-122853/3-A
Matrix: Water
Analysis Batch: 122959

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122853

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	14.5		ug/L		72	20 - 116	2	40
Butyl benzyl phthalate	20.0	14.3		ug/L		72	36 - 108	3	40
Di-n-butyl phthalate	20.0	13.5		ug/L		67	37 - 111	3	38
Diethyl phthalate	20.0	14.3		ug/L		72	36 - 109	2	39
Dimethyl phthalate	20.0	13.5		ug/L		68	37 - 106	4	42
Di-n-octyl phthalate	20.0	14.3		ug/L		72	11 - 127	4	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-122853/3-A
Matrix: Water
Analysis Batch: 122959

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 122853

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*16 - 122*
2-Fluorobiphenyl	*66*		*19 - 107*
2-Fluorophenol (Surr)	*69*		*10 - 111*
Nitrobenzene-d5 (Surr)	*72*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*69*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-122744/6
Matrix: Water
Analysis Batch: 122744

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			10/26/14 09:12	1

Lab Sample ID: LCS 180-122744/5
Matrix: Water
Analysis Batch: 122744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.8		mg/L		100	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-122781/1-A
Matrix: Water
Analysis Batch: 123209

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 122781

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/27/14 06:26	10/29/14 11:42	1
Iron	ND		50	9.5	ug/L		10/27/14 06:26	10/29/14 11:42	1
Nickel	ND		10	0.51	ug/L		10/27/14 06:26	10/29/14 11:42	1
Zinc	1.53	J	10	1.0	ug/L		10/27/14 06:26	10/29/14 11:42	1

Lab Sample ID: LCS 180-122781/3-A
Matrix: Water
Analysis Batch: 123209

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 122781

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	536		ug/L		107	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	511		ug/L		102	85 - 115
Zinc	500	506		ug/L		101	85 - 115

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 480-70015-1 MS
Matrix: Water
Analysis Batch: 123209

Client Sample ID: OC-FRAC 4-102314
Prep Type: Total Recoverable
Prep Batch: 122781

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	5.6	J	500	546		ug/L		108	70 - 130
Iron	ND		1000	1010		ug/L		101	70 - 130
Nickel	0.84	J	500	511		ug/L		102	70 - 130
Zinc	13	B	500	509		ug/L		99	70 - 130

Lab Sample ID: 480-70015-1 MSD
Matrix: Water
Analysis Batch: 123209

Client Sample ID: OC-FRAC 4-102314
Prep Type: Total Recoverable
Prep Batch: 122781

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	5.6	J	500	543		ug/L		108	70 - 130	0	20
Iron	ND		1000	1000		ug/L		100	70 - 130	1	20
Nickel	0.84	J	500	508		ug/L		101	70 - 130	0	20
Zinc	13	B	500	510		ug/L		100	70 - 130	0	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-210270/1-A
Matrix: Water
Analysis Batch: 210531

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 210270

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/27/14 13:00	10/28/14 08:26	1

Lab Sample ID: LCS 480-210270/2-A
Matrix: Water
Analysis Batch: 210531

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210270

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.109		mg/L		109	90 - 110

Lab Sample ID: 480-70015-1 DU
Matrix: Water
Analysis Batch: 210531

Client Sample ID: OC-FRAC 4-102314
Prep Type: Total/NA
Prep Batch: 210270

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phenolics, Total Recoverable	ND		ND		mg/L		NC	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-210502/1
Matrix: Water
Analysis Batch: 210502

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/28/14 12:30	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 480-210502/2
Matrix: Water
Analysis Batch: 210502

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	262	250		mg/L		95	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-210098/3
Matrix: Water
Analysis Batch: 210098

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/25/14 09:40	1

Lab Sample ID: LCS 480-210098/4
Matrix: Water
Analysis Batch: 210098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.940		mg/L		102	90 - 110

Lab Sample ID: 480-70015-1 DU
Matrix: Water
Analysis Batch: 210098

Client Sample ID: OC-FRAC 4-102314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

GC/MS Semi VOA

Prep Batch: 122853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	3520C	
LCS 180-122853/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-122853/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-122853/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 122959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	8270C LL	122853
LCS 180-122853/2-A	Lab Control Sample	Total/NA	Water	8270C LL	122853
LCSD 180-122853/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	122853
MB 180-122853/1-A	Method Blank	Total/NA	Water	8270C LL	122853

HPLC/IC

Analysis Batch: 122744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	300.0	
LCS 180-122744/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-122744/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 122781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total Recoverable	Water	200.7	
480-70015-1 MS	OC-FRAC 4-102314	Total Recoverable	Water	200.7	
480-70015-1 MSD	OC-FRAC 4-102314	Total Recoverable	Water	200.7	
LCS 180-122781/3-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-122781/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 123209

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total Recoverable	Water	200.7 Rev 4.4	122781
480-70015-1 MS	OC-FRAC 4-102314	Total Recoverable	Water	200.7 Rev 4.4	122781
480-70015-1 MSD	OC-FRAC 4-102314	Total Recoverable	Water	200.7 Rev 4.4	122781
LCS 180-122781/3-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	122781
MB 180-122781/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	122781

General Chemistry

Analysis Batch: 210098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	SM 4500 Cl G	
480-70015-1 DU	OC-FRAC 4-102314	Total/NA	Water	SM 4500 Cl G	
LCS 480-210098/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-210098/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Prep Batch: 210270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Prep Batch: 210270 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1 DU	OC-FRAC 4-102314	Total/NA	Water	Distill/Phenol	
LCS 480-210270/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-210270/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 210502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	SM 2540D	
LCS 480-210502/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-210502/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 210531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70015-1	OC-FRAC 4-102314	Total/NA	Water	420.4	210270
480-70015-1 DU	OC-FRAC 4-102314	Total/NA	Water	420.4	210270
LCS 480-210270/2-A	Lab Control Sample	Total/NA	Water	420.4	210270
MB 480-210270/1-A	Method Blank	Total/NA	Water	420.4	210270

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Client Sample ID: OC-FRAC 4-102314
Date Collected: 10/23/14 10:00
Date Received: 10/24/14 02:00

Lab Sample ID: 480-70015-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			122853	10/27/14 10:54	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	122959	10/28/14 16:43	VVP	TAL PIT
Total/NA	Analysis	300.0		5	122744	10/26/14 19:09	MJH	TAL PIT
Total Recoverable	Prep	200.7			122781	10/27/14 06:26	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	123209	10/29/14 11:57	RJG	TAL PIT
Total/NA	Prep	Distill/Phenol			210270	10/27/14 13:00	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	210531	10/28/14 09:28	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	210502	10/28/14 12:47	KS	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	210098	10/25/14 09:40	ELR	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70015-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70015-1	OC-FRAC 4-102314	Water	10/23/14 10:00	10/24/14 02:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation		**Analysis Requested**		Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG F4	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[redacted]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids								Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	S	N	N									
FRAC 4 - 102314	102314	1000	G	Water			X		X	X	X	X	X									
				Water																		

480-70015 Chain of Custody

Possible Hazard Identification		***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***	
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological		☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: L Johnson	Date/Time: 10-23-14	Company	Received by:	Date/Time: 10-23-14 1100	Company
Relinquished by:	Date/Time: 10-23-14	Company	Received by:	Date/Time: 10/24/14 0200	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 2.6#1		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70015-1

Login Number: 70015

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70015-1

Login Number: 70015
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/24/14 03:44 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 10/29/15

TestAmerica Job ID: 480-70185-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
10/31/2014 1:13:33 PM

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Job ID: 480-70185-1

Laboratory: TestAmerica Buffalo

Narrative

Receipt
The sample was received on 10/28/2014 2:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 2.6º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method SM 4500 Cl G: The following sample was received outside of holding time: FRAC 5-102714 (480-70185-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 123044. 8270_LL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Client Sample ID: FRAC 5-102714

Lab Sample ID: 480-70185-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.18	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	270	B	5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	5.2	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	10		10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Client Sample ID: FRAC 5-102714
Date Collected: 10/27/14 10:00
Date Received: 10/28/14 02:00

Lab Sample ID: 480-70185-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		10/28/14 14:01	10/29/14 18:10	1
Butyl benzyl phthalate	**0.18**	**J**	0.94	0.13	ug/L		10/28/14 14:01	10/29/14 18:10	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		10/28/14 14:01	10/29/14 18:10	1
Diethyl phthalate	ND		0.94	0.14	ug/L		10/28/14 14:01	10/29/14 18:10	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		10/28/14 14:01	10/29/14 18:10	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		10/28/14 14:01	10/29/14 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*68*		*16 - 122*	*10/28/14 14:01*	*10/29/14 18:10*	*1*
2-Fluorobiphenyl	*63*		*19 - 107*	*10/28/14 14:01*	*10/29/14 18:10*	*1*
2-Fluorophenol (Surr)	*61*		*10 - 111*	*10/28/14 14:01*	*10/29/14 18:10*	*1*
Nitrobenzene-d5 (Surr)	*70*		*23 - 112*	*10/28/14 14:01*	*10/29/14 18:10*	*1*
Phenol-d5 (Surr)	*60*		*15 - 112*	*10/28/14 14:01*	*10/29/14 18:10*	*1*
Terphenyl-d14	*77*		*10 - 132*	*10/28/14 14:01*	*10/29/14 18:10*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**270**	**B**	5.0	0.98	mg/L			10/29/14 22:15	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.2**	**J**	10	3.0	ug/L		10/29/14 06:16	10/29/14 21:21	1
Iron	ND		50	9.5	ug/L		10/29/14 06:16	10/29/14 21:21	1
Nickel	ND		10	0.51	ug/L		10/29/14 06:16	10/29/14 21:21	1
Zinc	**10**		10	1.0	ug/L		10/29/14 06:16	10/30/14 13:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/29/14 09:30	10/30/14 09:36	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			10/29/14 22:00	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/29/14 13:19	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-70185-1	FRAC 5-102714	68	63	61	70	60	77		
LCS 180-123044/2-A	Lab Control Sample	76	72	75	75	65	64		
LCSD 180-123044/3-A	Lab Control Sample Dup	76	71	72	78	67	68		
MB 180-123044/1-A	Method Blank	67	65	74	73	67	67		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-123044/1-A
Matrix: Water
Analysis Batch: 123086

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 123044

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		10/28/14 14:01	10/29/14 11:16	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		10/28/14 14:01	10/29/14 11:16	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		10/28/14 14:01	10/29/14 11:16	1
Diethyl phthalate	0.158	J	1.0	0.15	ug/L		10/28/14 14:01	10/29/14 11:16	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		10/28/14 14:01	10/29/14 11:16	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		10/28/14 14:01	10/29/14 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*67*		*16 - 122*	*10/28/14 14:01*	*10/29/14 11:16*	*1*
2-Fluorobiphenyl	*65*		*19 - 107*	*10/28/14 14:01*	*10/29/14 11:16*	*1*
2-Fluorophenol (Surr)	*74*		*10 - 111*	*10/28/14 14:01*	*10/29/14 11:16*	*1*
Nitrobenzene-d5 (Surr)	*73*		*23 - 112*	*10/28/14 14:01*	*10/29/14 11:16*	*1*
Phenol-d5 (Surr)	*67*		*15 - 112*	*10/28/14 14:01*	*10/29/14 11:16*	*1*
Terphenyl-d14	*67*		*10 - 132*	*10/28/14 14:01*	*10/29/14 11:16*	*1*

Lab Sample ID: LCS 180-123044/2-A
Matrix: Water
Analysis Batch: 123086

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 123044

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	14.2		ug/L		71	20 - 116
Butyl benzyl phthalate	20.0	14.2		ug/L		71	36 - 108
Di-n-butyl phthalate	20.0	13.7		ug/L		68	37 - 111
Diethyl phthalate	20.0	13.1		ug/L		66	36 - 109
Dimethyl phthalate	20.0	12.6		ug/L		63	37 - 106
Di-n-octyl phthalate	20.0	12.8		ug/L		64	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*
2-Fluorobiphenyl	*72*		*19 - 107*
2-Fluorophenol (Surr)	*75*		*10 - 111*
Nitrobenzene-d5 (Surr)	*75*		*23 - 112*
Phenol-d5 (Surr)	*65*		*15 - 112*
Terphenyl-d14	*64*		*10 - 132*

Lab Sample ID: LCSD 180-123044/3-A
Matrix: Water
Analysis Batch: 123086

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 123044

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	20.0	15.5		ug/L		77	20 - 116	9	40
Butyl benzyl phthalate	20.0	15.6		ug/L		78	36 - 108	9	40
Di-n-butyl phthalate	20.0	14.7		ug/L		73	37 - 111	7	38
Diethyl phthalate	20.0	14.3		ug/L		71	36 - 109	9	39
Dimethyl phthalate	20.0	13.7		ug/L		69	37 - 106	8	42
Di-n-octyl phthalate	20.0	13.4		ug/L		67	11 - 127	5	44

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels (Continued)

Lab Sample ID: LCSD 180-123044/3-A
Matrix: Water
Analysis Batch: 123086

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 123044

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*76*		*16 - 122*
2-Fluorobiphenyl	*71*		*19 - 107*
2-Fluorophenol (Surr)	*72*		*10 - 111*
Nitrobenzene-d5 (Surr)	*78*		*23 - 112*
Phenol-d5 (Surr)	*67*		*15 - 112*
Terphenyl-d14	*68*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-123098/6
Matrix: Water
Analysis Batch: 123098

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.426	J	1.0	0.20	mg/L			10/29/14 08:16	1

Lab Sample ID: LCS 180-123098/5
Matrix: Water
Analysis Batch: 123098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.7		mg/L		95	90 - 110

Lab Sample ID: LCSD 180-123098/7
Matrix: Water
Analysis Batch: 123098

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	51.0		mg/L		102	90 - 110	7	20

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-123082/1-A
Matrix: Water
Analysis Batch: 123245

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 123082

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/29/14 06:16	10/29/14 20:41	1
Iron	ND		50	9.5	ug/L		10/29/14 06:16	10/29/14 20:41	1
Nickel	ND		10	0.51	ug/L		10/29/14 06:16	10/29/14 20:41	1

Lab Sample ID: MB 180-123082/1-A
Matrix: Water
Analysis Batch: 123378

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 123082

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		10/29/14 06:16	10/30/14 13:01	1
Iron	ND		50	9.5	ug/L		10/29/14 06:16	10/30/14 13:01	1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 180-123082/1-A
Matrix: Water
Analysis Batch: 123378

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 123082

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		10	0.51	ug/L		10/29/14 06:16	10/30/14 13:01	1
Zinc	ND		10	1.0	ug/L		10/29/14 06:16	10/30/14 13:01	1

Lab Sample ID: LCS 180-123082/2-A
Matrix: Water
Analysis Batch: 123245

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 123082

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	534		ug/L		107	85 - 115
Iron	1000	1020		ug/L		102	85 - 115
Nickel	500	506		ug/L		101	85 - 115

Lab Sample ID: LCS 180-123082/2-A
Matrix: Water
Analysis Batch: 123378

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 123082

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	541		ug/L		108	85 - 115
Iron	1000	1030		ug/L		103	85 - 115
Nickel	500	515		ug/L		103	85 - 115
Zinc	500	507		ug/L		101	85 - 115

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-210777/1-A
Matrix: Water
Analysis Batch: 211063

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 210777

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		10/29/14 09:30	10/30/14 08:55	1

Lab Sample ID: LCS 480-210777/2-A
Matrix: Water
Analysis Batch: 211063

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 210777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0995		mg/L		99	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-210753/1
Matrix: Water
Analysis Batch: 210753

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			10/29/14 12:53	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 480-210753/2
Matrix: Water
Analysis Batch: 210753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	236	225		mg/L		95	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-210881/3
Matrix: Water
Analysis Batch: 210881

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			10/29/14 22:00	1

Lab Sample ID: LCS 480-210881/4
Matrix: Water
Analysis Batch: 210881

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.950		mg/L		103	90 - 110

Lab Sample ID: 480-70185-1 DU
Matrix: Water
Analysis Batch: 210881

Client Sample ID: FRAC 5-102714
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chlorine, Total Residual	ND	HF	ND		mg/L		NC	20

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

GC/MS Semi VOA

Prep Batch: 123044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	3520C	
LCS 180-123044/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 180-123044/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 180-123044/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 123086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	8270C LL	123044
LCS 180-123044/2-A	Lab Control Sample	Total/NA	Water	8270C LL	123044
LCSD 180-123044/3-A	Lab Control Sample Dup	Total/NA	Water	8270C LL	123044
MB 180-123044/1-A	Method Blank	Total/NA	Water	8270C LL	123044

HPLC/IC

Analysis Batch: 123098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	300.0	
LCS 180-123098/5	Lab Control Sample	Total/NA	Water	300.0	
LCSD 180-123098/7	Lab Control Sample Dup	Total/NA	Water	300.0	
MB 180-123098/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 123082

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total Recoverable	Water	200.7	
LCS 180-123082/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-123082/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 123245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total Recoverable	Water	200.7 Rev 4.4	123082
LCS 180-123082/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	123082
MB 180-123082/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	123082

Analysis Batch: 123378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total Recoverable	Water	200.7 Rev 4.4	123082
LCS 180-123082/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	123082
MB 180-123082/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	123082

General Chemistry

Analysis Batch: 210753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	SM 2540D	
LCS 480-210753/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-210753/1	Method Blank	Total/NA	Water	SM 2540D	

General Chemistry (Continued)

Prep Batch: 210777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	Distill/Phenol	
LCS 480-210777/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-210777/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 210881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	SM 4500 Cl G	
480-70185-1 DU	FRAC 5-102714	Total/NA	Water	SM 4500 Cl G	
LCS 480-210881/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-210881/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 211063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70185-1	FRAC 5-102714	Total/NA	Water	420.4	210777
LCS 480-210777/2-A	Lab Control Sample	Total/NA	Water	420.4	210777
MB 480-210777/1-A	Method Blank	Total/NA	Water	420.4	210777

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Client Sample ID: FRAC 5-102714
Date Collected: 10/27/14 10:00
Date Received: 10/28/14 02:00

Lab Sample ID: 480-70185-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			123044	10/28/14 14:01	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	123086	10/29/14 18:10	VVP	TAL PIT
Total/NA	Analysis	300.0		5	123098	10/29/14 22:15	MJH	TAL PIT
Total Recoverable	Prep	200.7			123082	10/29/14 06:16	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	123245	10/29/14 21:21	RJG	TAL PIT
Total Recoverable	Prep	200.7			123082	10/29/14 06:16	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	123378	10/30/14 13:31	RJR	TAL PIT
Total/NA	Prep	Distill/Phenol			210777	10/29/14 09:30	RMZ	TAL BUF
Total/NA	Analysis	420.4		1	211063	10/30/14 09:36	NCH	TAL BUF
Total/NA	Analysis	SM 2540D		1	210753	10/29/14 13:19	KS	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	210881	10/29/14 22:00	JMB	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70185-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70185-1	FRAC 5-102714	Water	10/27/14 10:00	10/28/14 02:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation		Analysis Requested		Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
City: Wilmington	TAT Requested (days): A.S.A.P.			
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG F5	Project #: 48006853			
Site: Wilmington MA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
Frac.5 - 102714	10.27.14	1000	G	Water			X		X	X	X	X	X		
				Water											

480-70185 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10.27.14			10.27.14 1100	TA
2		10-27-14 1650	TA		10/28/14 0200	TA
3		Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.6 #1

10/31/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70185-1

Login Number: 70185

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	olin corp
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	False	subcon lab to check rc

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70185-1

Login Number: 70185
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/28/14 12:37 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY: 6/29/15

TestAmerica Job ID: 480-70624-1
Client Project/Site: Wilmington Plant B RPG

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
11/7/2014 4:47:11 PM
Brian Fischer, Manager of Project Management
(716)504-9835
brian.fischer@testamericainc.com

Designee for

Becky Mason, Project Manager II
(413)572-4000
becky.mason@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Job ID: 480-70624-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-70624-1

Comments
No additional comments.

Receipt
The sample was received on 11/4/2014 1:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method(s) SM 4500 Cl G: The following sample(s) was received outside of holding time: OC-FRAC 4 110314 (480-70624-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Client Sample ID: OC-FRAC 4 110314

Lab Sample ID: 480-70624-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Butyl benzyl phthalate	0.14	J	0.94	0.13	ug/L	1		8270C LL	Total/NA
Chloride	240		5.0	0.98	mg/L	5		300.0	Total/NA
Arsenic	4.0	J	10	3.0	ug/L	1		200.7 Rev 4.4	Total Recoverable
Zinc	7.0	J	10	1.0	ug/L	1		200.7 Rev 4.4	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Client Sample ID: OC-FRAC 4 110314
Date Collected: 11/03/14 11:00
Date Received: 11/04/14 01:00

Lab Sample ID: 480-70624-1
Matrix: Water

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	1.2	ug/L		11/04/14 12:55	11/07/14 13:06	1
Butyl benzyl phthalate	**0.14**	**J**	0.94	0.13	ug/L		11/04/14 12:55	11/07/14 13:06	1
Di-n-butyl phthalate	ND		0.94	0.12	ug/L		11/04/14 12:55	11/07/14 13:06	1
Diethyl phthalate	ND		0.94	0.14	ug/L		11/04/14 12:55	11/07/14 13:06	1
Dimethyl phthalate	ND		0.94	0.072	ug/L		11/04/14 12:55	11/07/14 13:06	1
Di-n-octyl phthalate	ND		0.94	0.19	ug/L		11/04/14 12:55	11/07/14 13:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*69*		*16 - 122*	*11/04/14 12:55*	*11/07/14 13:06*	*1*
2-Fluorobiphenyl	*50*		*19 - 107*	*11/04/14 12:55*	*11/07/14 13:06*	*1*
2-Fluorophenol (Surr)	*48*		*10 - 111*	*11/04/14 12:55*	*11/07/14 13:06*	*1*
Nitrobenzene-d5 (Surr)	*56*		*23 - 112*	*11/04/14 12:55*	*11/07/14 13:06*	*1*
Phenol-d5 (Surr)	*45*		*15 - 112*	*11/04/14 12:55*	*11/07/14 13:06*	*1*
Terphenyl-d14	*57*		*10 - 132*	*11/04/14 12:55*	*11/07/14 13:06*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**240**		5.0	0.98	mg/L			11/06/14 13:52	5

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.0**	**J**	10	3.0	ug/L		11/05/14 04:12	11/05/14 14:21	1
Iron	ND		50	9.5	ug/L		11/05/14 04:12	11/05/14 14:21	1
Nickel	ND		10	0.51	ug/L		11/05/14 04:12	11/05/14 14:21	1
Zinc	**7.0**	**J**	10	1.0	ug/L		11/05/14 04:12	11/05/14 14:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		11/04/14 17:50	11/06/14 11:57	1
Chlorine, Total Residual	ND	HF	0.020	0.010	mg/L			11/07/14 15:45	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			11/04/14 11:42	1

Surrogate Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	FBP	2FP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(16-122)	(19-107)	(10-111)	(23-112)	(15-112)	(10-132)		
480-70624-1	OC-FRAC 4 110314	69	50	48	56	45	57		
LCS 180-123863/2-A	Lab Control Sample	87	69	74	74	69	66		
MB 180-123863/1-A	Method Blank	80	64	74	71	69	69		

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14

Method: 8270C LL - Semivolatile Organic Compounds by GCMS - Low Levels

Lab Sample ID: MB 180-123863/1-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 123863

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		2.0	1.3	ug/L		11/04/14 12:54	11/07/14 12:10	1
Butyl benzyl phthalate	ND		1.0	0.14	ug/L		11/04/14 12:54	11/07/14 12:10	1
Di-n-butyl phthalate	ND		1.0	0.12	ug/L		11/04/14 12:54	11/07/14 12:10	1
Diethyl phthalate	ND		1.0	0.15	ug/L		11/04/14 12:54	11/07/14 12:10	1
Dimethyl phthalate	ND		1.0	0.077	ug/L		11/04/14 12:54	11/07/14 12:10	1
Di-n-octyl phthalate	ND		1.0	0.21	ug/L		11/04/14 12:54	11/07/14 12:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*80*		*16 - 122*	*11/04/14 12:54*	*11/07/14 12:10*	*1*
2-Fluorobiphenyl	*64*		*19 - 107*	*11/04/14 12:54*	*11/07/14 12:10*	*1*
2-Fluorophenol (Surr)	*74*		*10 - 111*	*11/04/14 12:54*	*11/07/14 12:10*	*1*
Nitrobenzene-d5 (Surr)	*71*		*23 - 112*	*11/04/14 12:54*	*11/07/14 12:10*	*1*
Phenol-d5 (Surr)	*69*		*15 - 112*	*11/04/14 12:54*	*11/07/14 12:10*	*1*
Terphenyl-d14	*69*		*10 - 132*	*11/04/14 12:54*	*11/07/14 12:10*	*1*

Lab Sample ID: LCS 180-123863/2-A
Matrix: Water
Analysis Batch: 124289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 123863

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	20.0	15.1		ug/L		76	20 - 116
Butyl benzyl phthalate	20.0	14.4		ug/L		72	36 - 108
Di-n-butyl phthalate	20.0	14.4		ug/L		72	37 - 111
Diethyl phthalate	20.0	15.1		ug/L		75	36 - 109
Dimethyl phthalate	20.0	14.6		ug/L		73	37 - 106
Di-n-octyl phthalate	20.0	15.2		ug/L		76	11 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*16 - 122*
2-Fluorobiphenyl	*69*		*19 - 107*
2-Fluorophenol (Surr)	*74*		*10 - 111*
Nitrobenzene-d5 (Surr)	*74*		*23 - 112*
Phenol-d5 (Surr)	*69*		*15 - 112*
Terphenyl-d14	*66*		*10 - 132*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 180-124141/6
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.20	mg/L			11/06/14 08:53	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-124141/5
Matrix: Water
Analysis Batch: 124141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.3		mg/L		97	90 - 110

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 180-123921/1-A
Matrix: Water
Analysis Batch: 124088

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 123921

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	3.0	ug/L		11/05/14 04:12	11/05/14 14:12	1
Iron	ND		50	9.5	ug/L		11/05/14 04:12	11/05/14 14:12	1
Nickel	ND		10	0.51	ug/L		11/05/14 04:12	11/05/14 14:12	1
Zinc	ND		10	1.0	ug/L		11/05/14 04:12	11/05/14 14:12	1

Lab Sample ID: LCS 180-123921/2-A
Matrix: Water
Analysis Batch: 124088

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 123921

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	532		ug/L		106	85 - 115
Iron	1000	1040		ug/L		104	85 - 115
Nickel	500	512		ug/L		102	85 - 115
Zinc	500	504		ug/L		101	85 - 115

Lab Sample ID: 480-70624-1 MS
Matrix: Water
Analysis Batch: 124088

Client Sample ID: OC-FRAC 4 110314
Prep Type: Total Recoverable
Prep Batch: 123921

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.0	J	500	550		ug/L		109	70 - 130
Iron	ND		1000	1030		ug/L		103	70 - 130
Nickel	ND		500	521		ug/L		104	70 - 130
Zinc	7.0	J	500	512		ug/L		101	70 - 130

Lab Sample ID: 480-70624-1 MSD
Matrix: Water
Analysis Batch: 124088

Client Sample ID: OC-FRAC 4 110314
Prep Type: Total Recoverable
Prep Batch: 123921

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.0	J	500	537		ug/L		107	70 - 130	2	20
Iron	ND		1000	994		ug/L		99	70 - 130	3	20
Nickel	ND		500	505		ug/L		101	70 - 130	3	20
Zinc	7.0	J	500	498		ug/L		98	70 - 130	3	20

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 480-212045/1-A
Matrix: Water
Analysis Batch: 212525

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 212045

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.010	0.0050	mg/L		11/04/14 17:50	11/06/14 10:27	1

Lab Sample ID: LCS 480-212045/2-A
Matrix: Water
Analysis Batch: 212525

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 212045

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0927		mg/L		93	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 480-211919/1
Matrix: Water
Analysis Batch: 211919

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	4.0	mg/L			11/04/14 10:55	1

Lab Sample ID: LCS 480-211919/2
Matrix: Water
Analysis Batch: 211919

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	236	238		mg/L		101	88 - 110

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 480-212833/3
Matrix: Water
Analysis Batch: 212833

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.020	0.010	mg/L			11/07/14 15:45	1

Lab Sample ID: LCS 480-212833/4
Matrix: Water
Analysis Batch: 212833

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorine, Total Residual	0.920	0.950		mg/L		103	90 - 110

QC Association Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

GC/MS Semi VOA

Prep Batch: 123863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	3520C	
LCS 180-123863/2-A	Lab Control Sample	Total/NA	Water	3520C	
MB 180-123863/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 124289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	8270C LL	123863
LCS 180-123863/2-A	Lab Control Sample	Total/NA	Water	8270C LL	123863
MB 180-123863/1-A	Method Blank	Total/NA	Water	8270C LL	123863

HPLC/IC

Analysis Batch: 124141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	300.0	
LCS 180-124141/5	Lab Control Sample	Total/NA	Water	300.0	
MB 180-124141/6	Method Blank	Total/NA	Water	300.0	

Metals

Prep Batch: 123921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total Recoverable	Water	200.7	
480-70624-1 MS	OC-FRAC 4 110314	Total Recoverable	Water	200.7	
480-70624-1 MSD	OC-FRAC 4 110314	Total Recoverable	Water	200.7	
LCS 180-123921/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 180-123921/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 124088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total Recoverable	Water	200.7 Rev 4.4	123921
480-70624-1 MS	OC-FRAC 4 110314	Total Recoverable	Water	200.7 Rev 4.4	123921
480-70624-1 MSD	OC-FRAC 4 110314	Total Recoverable	Water	200.7 Rev 4.4	123921
LCS 180-123921/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	123921
MB 180-123921/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	123921

General Chemistry

Analysis Batch: 211919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	SM 2540D	
LCS 480-211919/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 480-211919/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 212045

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	Distill/Phenol	
LCS 480-212045/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
MB 480-212045/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

General Chemistry (Continued)

Analysis Batch: 212525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	420.4	212045
LCS 480-212045/2-A	Lab Control Sample	Total/NA	Water	420.4	212045
MB 480-212045/1-A	Method Blank	Total/NA	Water	420.4	212045

Analysis Batch: 212833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-70624-1	OC-FRAC 4 110314	Total/NA	Water	SM 4500 Cl G	
LCS 480-212833/4	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 480-212833/3	Method Blank	Total/NA	Water	SM 4500 Cl G	

Lab Chronicle

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Client Sample ID: OC-FRAC 4 110314
Date Collected: 11/03/14 11:00
Date Received: 11/04/14 01:00

Lab Sample ID: 480-70624-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			123863	11/04/14 12:55	BJT	TAL PIT
Total/NA	Analysis	8270C LL		1	124289	11/07/14 13:06	VVP	TAL PIT
Total/NA	Analysis	300.0		5	124141	11/06/14 13:52	MJH	TAL PIT
Total Recoverable	Prep	200.7			123921	11/05/14 04:12	SLB	TAL PIT
Total Recoverable	Analysis	200.7 Rev 4.4		1	124088	11/05/14 14:21	RJR	TAL PIT
Total/NA	Prep	Distill/Phenol			212045	11/04/14 17:50	JMB	TAL BUF
Total/NA	Analysis	420.4		1	212525	11/06/14 11:57	ELR	TAL BUF
Total/NA	Analysis	SM 2540D		1	211919	11/04/14 11:42	KS	TAL BUF
Total/NA	Analysis	SM 4500 Cl G		1	212833	11/07/14 15:45	JMB	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Laboratory: TestAmerica Buffalo

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Massachusetts	State Program	1	M-NY044	06-30-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
SM 4500 Cl G		Water	Chlorine, Total Residual

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-15
California	State Program	9	2891	03-31-15
Connecticut	State Program	1	PH-0688	09-30-16
Florida	NELAP	4	E871008	06-30-15
Illinois	NELAP	5	002602	06-30-15
Kansas	NELAP	7	E-10350	01-31-15
Louisiana	NELAP	6	04041	06-30-15
New Hampshire	NELAP	1	203011	04-04-15
New Jersey	NELAP	2	PA005	06-30-15
New York	NELAP	2	11182	03-31-15
North Carolina (WW/SW)	State Program	4	434	12-31-14
Pennsylvania	NELAP	3	02-00416	04-30-15
South Carolina	State Program	4	89014	04-30-15
Texas	NELAP	6	T104704528	03-31-15
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P330-10-00139	05-23-16
Utah	NELAP	8	STLP	05-31-15
Virginia	NELAP	3	460189	09-14-15
West Virginia DEP	State Program	3	142	01-31-15

Method Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Method	Method Description	Protocol	Laboratory
8270C LL	Semivolatile Organic Compounds by GCMS - Low Levels	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL PIT
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PIT
420.4	Phenolics, Total Recoverable	MCAWW	TAL BUF
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL BUF
SM 4500 Cl G	Chlorine, Residual	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Olin Corporation
Project/Site: Wilmington Plant B RPG

TestAmerica Job ID: 480-70624-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-70624-1	OC-FRAC 4 110314	Water	11/03/14 11:00	11/04/14 01:00

TestAmerica Boston
240 Bear Hill Rd., Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica

Client Information	Sampler: L Johnson	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 480-41314-10069.1
Client Contact: Mr. Brian Guichard	Phone: 978 658 6121	E-Mail: becky.mason@testamericainc.com		Page: Page 1 of 1
Company: Olin Corporation		Analysis Requested		Job #:
Address: 51 Eames street	Due Date Requested:			Preservation Codes:
City: Wilmington	TAT Requested (days): A.S.A.P.			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: MA, 01887				
Phone: 978 658 6121	PO #: REWI0020			Other:
Email: beguichard@olin.com	WO #:			
Project Name: Wilmington Plant B RPG F4	Project #: 48006853			
Site: WILMINGTON MA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_Cl_F - Chlorine	[illegible]	300.0_28D - Chloride	200.7 - As/Ni/Zn/Fe	420.4 - Phenolics, Total Recoverable	8270C_LL - RGP 8270	2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	S	N	N	X	
			G	Water											
FRAC 4- 110314	11-3-14	1100	G	Water	X		X		X	X	X	X	X		

480-70624 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	L Johnson	11-3-14			11-3-14 1130	FE
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		11-3-14 1650	FE		11/04/14 0100	TA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		3.0 #1

11/7/2014

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70624-1

Login Number: 70624

List Number: 1

Creator: Kolb, Chris M

List Source: TestAmerica Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-70624-1

Login Number: 70624
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 11/04/14 11:16 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX C

Weir Monthly Inspection Reports
April 2014 – September 2014

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – April 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of April 2014 are attached. AMEC conducted an inspection on Friday, April 25, 2014.

West Ditch Off-Property

Station A had a normal level of clear water for all inspections of the month. Station B had a normal level of clear water for all inspections of the month.

Weir

Station D had a normal level of clear water for the first three of the inspections of the month and a high level of clear water for the final inspection of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water.

South Ditch Downstream of the Weir

Stations E and F had a moderate flow of clear water for all inspections of the month. Light foaming was noted near Station E during the first three inspections of the month. A moderate flow of clear water was observed at Station G during the first three inspections of the month. Station G was flooded with clear water during the final inspection of the month.

A low flow of clear water was observed, at the haybale line, during first two inspections of the month. A moderate flow of clear water was observed at the haybale line for the final two inspections of the month.

Wetland Areas South of the South Ditch

Station H had standing water throughout the month. Station I was flooded with clear water for two inspections of the month and was saturated soil for two inspections of the month.

Wildlife

Birds observed along the South Ditch during the final inspection included mallards, robins, a woodpecker and a tufted titmouse.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2014\April 2014\April 2014 Weir Inspection Report.doc]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/2/2014 Time 13:00:00 Inspectors Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow with some light foaming at the check dams.
	Station E	x		
	Station F	x		
	Station G	x		Stn G moderate flow through the center.
Unnamed Ditch				Stn H and Stn I are both saturated soil with some free standing water.
	Station H		x	
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no from the weir and moderate flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay bale line has a low flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/11/2014 **Time** 9:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow with some light foaming at the check dams.
	Station E	x		
	Station F	x		
	Station G	x		Stn G moderate flow through the center.
Unnamed Ditch				Stn H is saturated soil with some free standing water.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate from the weir and no flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water.

The Hay bale line has a low flow of clear water.

Note: the tick season is already well underway.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 4/18/2014 **Time** 13::00 AM **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		Stn G has a moderate flow through the center the
	Station G	x		vegetation is starting to grow for the season.
Unnamed Ditch				Stn H is satruated soil and some free standing water.
	Station H		x	Stn I is satruated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the weir and a light flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water with some light foaming at the check dams.

The Hay bale line has a moderate flow of clear water.

Picked up 7 ticks along the walk.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 4/25/2014 **Time:** 8:15 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A has a normal level of clear water.
	Station A		X	Station B has a normal level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a high level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a moderate flow of clear
	Station E	X		water. A brown or rust color is on the bottom.
	Station F	X		Station G is flooded with clear water.
	Station G		X	
Unnamed Ditch				Station H has a small area of standing water.
	Station H		X	Station I is flooded with clear water.
	Station I		X	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a moderate flow from the plant B outlet pipe and a low flow from the weir outlet pipe. The main area has a high level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a moderate flow of clear water.

Two ducks, a hawks, robins, a woodpecker, and a tufted titmouse were observed along the ditch.

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – May 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of May 2014 are attached. AMEC conducted an inspection on Friday, May 30, 2014.

West Ditch Off-Property

Station A had a normal level of clear water for the first four inspections of the month and a low level of clear water during the final inspection of the month. Station B had a normal level of clear water for three inspections of the month and a low level of clear water for two inspections of the month.

Weir

Station D had a normal level of lightly cloudy water for the first inspection of the month and normal level of clear water for the other four inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a heavy flow of clear water. The main area had lightly cloudy water during one inspection of the month and clear water during the remaining four inspections of the month. A brown or rust colored bottom was noted at the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a heavy flow of clear water during the first inspection of the month and a normal flow for the second and third inspections of the month. Stations E and F had a moderate flow of clear water for the final two inspections of the month. Light foaming was noted near Station E during four of the inspections of the month. A heavy flow of clear water was observed at Station G during the first inspection of the month. A low flow of clear water was observed at Station G during the second and third inspections. Station G was flooded with clear water during the final inspection of the month.

A heavy flow of clear water was observed, at the haybale line, during the first inspection of the month. A low flow of clear water was observed at the haybale line for three inspections of the month and a moderate flow of clear water was observed at the haybale line during the final inspection of the month.

Wetland Areas South of the South Ditch

Station H had standing water throughout the month. Station I was flooded with clear water for two inspections of the month and was saturated soil for three inspections of the month.

Wildlife

Birds observed along the South Ditch during the final inspection included mallards, a red-winged blackbird, and a cardinal.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2014\May 2014\May 2014 Weir Inspection Report.doc]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/2/2014 **Time** 10:40 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of lighty turbid water.
	Station D	x		
Weir - Downstream				Stations E & F have a high flow of clear water.
	Station E	x		
	Station F	x		Stn G has a high flow through the center the
	Station G	x		remaining area is flooded.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is mostly free standing water.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the weir and a high flow from the outlet pipe. The main area is clear. The stream has a high flow of clear water with some light foaming at the check dams.

There is the remains of a broken tree top across the path just upstream from the foot bridge.

The Hay bale line has a elevated flow of clear water.

Noticed two Geese in the pond area.

Picked up 13 ticks along the walk.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/9/2014 **Time** 13:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G low flow through the center.
Unnamed Ditch				Stn H has some free standing water.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no from the weir and a low flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water.

The Hay bale line has a low flow of clear water.

Note: Picked up 17 ticks on the walk.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/16/2014 **Time** 11:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a low level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G low flow through the center.
Unnamed Ditch				Stn H has some free standing water.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no from the weir and no flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water. There is some light foaming after the check dams and near the foot bridge.

The Hay bale line has a low flow of clear water.

Note: Picked up 9 ticks on the walk.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 5/23/2014 **Time** 8:30 **Inspectors** Brian Guichard

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a moderate flow through the center.
Unnamed Ditch				Stn H has free standing water.
	Station H		x	Stn I has saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a low flow from the weir and no flow from the outlet pipe. The main area is lightly cloudy. The stream has a moderate flow of clear water. There is some light foaming near the foot bridge.

The Hay bale line has a low flow of clear water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 5/30/2014 **Time:** 12:15 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A has a low level of clear water.
	Station A		X	Station B has a low level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a moderate flow of clear
	Station E	X		water with some foaming at the check dams.
	Station F	X		Station G is flooded with clear water.
	Station G		X	
Unnamed Ditch				Station H is flooded with clear water.
	Station H		X	Station I is flooded with clear water.
	Station I		X	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a low flow from the plant B outlet pipe and a low flow from the weir outlet pipe. The main area has a normal level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a moderate flow of clear water with some foaming.

A redwing black bird, cardinal and duck were observed along the South Ditch.

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – June 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of June 2014 are attached. Only three inspections were completed for the month of June. AMEC conducted an inspection on Friday, June 27, 2014.

West Ditch Off-Property

Station A had a normal level of clear water for two inspections of the month and a low level of water for the final inspection of the month. Station B had a normal level of clear water for all inspections of the month.

Weir

Station D had a normal level of clear water for all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had cloudy water during the first two inspections of the month and clear water during the final inspection of the month. A brown or rust colored bottom was noted at the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a moderate flow of clear water for all inspections of the month. Light foaming was noted near Station F during the first two inspections of the month. A

moderate flow of clear water was observed at Station G during the first two inspections of the month. The view of the water at Station G was obstructed by vegetation during the final inspection of the month.

A low flow of clear water was observed, at the haybale line, during first two inspections of the month. A moderate flow of clear water was observed at the haybale line for the final inspection of the month.

Wetland Areas South of the South Ditch

Station H had standing water throughout the month. Station I was flooded with clear water for two inspections of the month and had some standing water during the final inspection of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2014\June 2014\June 2014 Weir Inspection Report.doc]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 6/6/2014 **Time** 0:30 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a moderate flow through the center.
Unnamed Ditch				Stn H has free standing water.
	Station H		x	Stn I has free standing water.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate flow from the weir and a low flow from the outlet pipe. The main area is cloudy. The stream has a moderate flow of clear water. There is some light foaming after the check dams and near the foot bridge.

Removed fallen tree and cleared the trailway path of overgrowth and branches.

The Hay bale line has a low flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 6/13/2014 **Time** 10:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G has a moderate flow through the center.
Unnamed Ditch				Stn H has free standing water.
	Station H		x	Stn I has free standing water.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no from the weir and a low flow from the outlet pipe. The main area is cloudy. The stream has a low flow of clear water. There is some light foaming after the check dams and near the foot bridge.

The Hay bale line has a low flow of clear water.

Note: Picked up several ticks on the walk.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 6/27/2014 **Time:** 9:00 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A has a low level of clear water.
	Station A		X	Station B has a normal level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a moderate flow of clear
	Station E	X		water.
	Station F	X		The vegetation at Station G is starting to grow
	Station G		X	and obstruct the view of the stream.
Unnamed Ditch				Station H is flooded with clear water.
	Station H		X	Station I has some standing water but
	Station I		X	is mostly saturated soil.
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a no flow from the plant B outlet pipe and a low flow from the weir outlet pipe. The main area has a normal level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a moderate flow of clear water.

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – July 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of July 2014 are attached. AMEC conducted an inspection on Thursday, July 24, 2014.

West Ditch Off-Property

Station A had a normal level of clear water for two inspections of the month and a low level of clear water for two inspections of the month. Station B had a low level of clear water for three inspections of the month and a normal level of clear water for one inspection of the month.

Weir

Station D had a normal level of clear water for the all inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from a low flow to a moderate flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a heavy flow of clear water. The main area had slightly cloudy water during the first inspection of the month and clear water during the remaining three inspections of the month. A brown or rust colored bottom was noted at the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a low flow of clear water for the second and final inspections of the month. Stations E and F had a moderate flow of clear water for the first inspection of the

month and heavy flow of clear water during the third inspection of the month. Light foaming was noted near Station E during all inspections of the month. A moderate flow of clear water was observed at Station G during the first inspection of the month. Station G was covered with vegetation during the final three inspections of the month.

A low flow of clear water was observed, at the haybale line, during three inspections of the month. A heavy flow of clear water was observed at the haybale line during the third inspection of the month.

Wetland Areas South of the South Ditch

Station H had standing water for two inspections of the month and was saturated soil during two inspections of the month. Station I was flooded with clear water for one inspections of the month and was saturated soil for three inspections of the month.

Wildlife

Fox pups were observed along the South Ditch during the first and third inspections of the month. Multiple frogs were observed along the South Ditch during the final inspection of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2014\July 2014\July 2014 Weir Inspection Report.doc]

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Inspection Report

Date 7/3/2014 **Time** 7:30 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a low level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G moderate flow through the center.
Unnamed Ditch				Stn H has some free standing water.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a low from the weir and a low flow from the outlet pipe. The main area is lightly cloudy. The stream has a low flow of clear water. There is some light foaming after the check dams and near the foot bridge.

The Hay bale line has a low flow of clear water.

Note: Noticed three young pups (either Fox or Coyote) on the path by the bridge.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/11/2014 **Time** 11:30 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate from the weir and no flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water. There is some light foaming after the check dams and near the foot bridge.

The Hay bale line has a low flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 7/18/2014 **Time** 10:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a low level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a high flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is flooded.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a moderate from the weir and a high flow from the outlet pipe. The main area is clear. The stream has a high flow of clear water. There is some light foaming after the check dams and near the foot bridge. The walking path is saturated soil and mud.

The Hay bale line has a high flow of clear water.

Note: Saw two Fox cubs near the foot bridge.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 7/24/2014 **Time:** 7:45 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A has a low level of clear water.
	Station A		X	Station B has a low level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a low flow of clear
	Station E	X		water with some foaming at the check dams.
	Station F	X		Station G is covered with vegetation.
	Station G		X	
Unnamed Ditch				Station H is saturated soil.
	Station H		X	Station I is saturated soil.
	Station I		X	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a no flow from the plant B outlet pipe and a low flow from the weir outlet pipe. The main area has a normal level of clear water. A brown or rust color is visible on the bottom.

The haybale line has a low flow of clear water.

Multiple frogs were observed along the South Ditch.

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – August 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of August 2014 are attached. AMEC conducted an inspection on Thursday, August 28, 2014.

West Ditch Off-Property

Station A had water levels ranging from low to normal throughout the month. The water at Station A was noted as clear for all inspections. Station B had a normal level of clear water for the first four inspections of the month and a low level of clear water for the final inspection of the month.

Weir

Station D had a normal level of clear water for all five inspections of the month.

Flow from the Weir outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had clear water during all inspections of the month. A brown or rust colored bottom was noted at the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a moderate flow of clear water for the first inspection of the month and a low flow of clear water for the remaining four inspections of the month. Light

foaming was noted near Station E during the first and final inspections of the month. Station G was covered by vegetation during all inspections of the month.

A low flow of clear water was observed, at the haybale line, during three inspections of the month. No flow was observed at the haybale line during the other two inspections of the month.

Wetland Areas South of the South Ditch

Stations H and I were flooded with clear water during the first inspection of the month. Stations H and I were saturated soil during the remaining four inspections of the month.

Wildlife

Frogs were observed along the South Ditch during the first and final inspections of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
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Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 8/1/2014 **Time** 0:30 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a moderate flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is flooded.
	Station H		x	Stn I is flooded.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no from the weir and a low flow from the outlet pipe. The main area is clear. The stream has a moderate flow of clear water. There is some light foaming after the check dams and near the foot bridge.

The Hay bale line has a low flow of clear water.

Noticed lots of frogs along the path and in the stream.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Inspection Report

Date 8/8/2014 Time 1:00 Inspectors Brian Guichard

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a trickle flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a trickle flow from the weir and no flow from the outlet pipe. The main area is clear. The stream has a trickle flow of clear water.

The Hay bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Inspection Report

Date 8/15/2014 **Time** 8:30 **Inspectors** Brian Guichard

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a trickle flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir and no flow from the outlet pipe. The main area is clear. The stream has a trickle flow of clear water.

The Hay bale line has no noticeable flow at this time.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Inspection Report

Date 8/22/2014 **Time** 10:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is saturated soil and some standing water.
	Station H		x	Stn I is saturated soil.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is a low flow from the weir and no flow from the outlet pipe. The main area is clear. The stream has a low flow of clear water.

The Hay bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 8/28/2014 **Time:** 2:00 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A has a low level of clear water.
	Station A		X	Station B has a low level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a normal level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a low flow of clear
	Station E	X		water with some foaming at the check dams.
	Station F	X		Station G is covered with vegetation and
	Station G		X	water in the center channel.
Unnamed Ditch				Station H is dry.
	Station H		X	Station I is dry.
	Station I		X	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a no flow from the plant B outlet pipe and no flow from the weir outlet pipe. The main area has a low level of clear water. A brown or rust color is visible on the bottom.

The haybale line has standing water only, no flow.

Multiple frogs were observed along the South Ditch.

December 30, 2014

Wilmington Conservation Commission
Town Hall
121 Glen Road
Wilmington, MA 01887
Attn: Winifred McGowan

RE: Olin Corporation – DEP File #344-419
Weir Inspection Report – September 2014
AMEC Project No. 6107-14-0016.04

Dear Commission:

This letter documents the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by AMEC E&I, Inc. (AMEC) and Olin Corporation. The weekly weir inspection reports for the month of September 2014 are attached. AMEC conducted an inspection on Friday, September 26, 2014.

West Ditch Off-Property

Station A had a normal level of clear water during the first inspection of the month and a low level of clear water during the final three inspections. Station B had a normal level of clear water for the first three inspections of the month and a low level of clear water during the final inspection of the month.

Weir

Station D had a normal level of clear water for the first three of the inspections of the month and a low level of clear water for the final inspection of the month.

No flow from the Weir outlet pipe was observed during any of the inspections of the month. Flow from the Plant B outlet pipe fluctuated throughout the month from no flow to a low flow of clear water. The main area had lightly cloudy water during all inspections of the month. A brown or rust colored bottom was noted at the main area during the final inspection of the month.

South Ditch Downstream of the Weir

Stations E and F had a low flow of clear water for all inspections of the month. Light foaming was noted near Station E during three inspections of the month. Station G was covered with vegetation throughout the month.

A low flow of clear water was observed, at the haybale line, during first three inspections of the month. The haybale line was dry during the final inspection of the month.

Wetland Areas South of the South Ditch

Station H was saturated soil during the first three inspections of the month and dry during the final inspection of the month. Station I was dry during all inspections of the month.

Please feel free to call at 978-692-9090 with any questions.

Sincerely,
AMEC E&I, Inc.

Brian Roden
Project Scientist

Michael J. Murphy
Project Principal

Attachments

cc: Mr. James Cashwell, Olin Corp. (Electronic)
Mr. Brian Guichard, Olin Corp.
Mr. Jim DiLorenzo, EPA
Mr. Joe Coyne, MassDEP – Boston (Electronic)
AMEC Project File
[P:\old_Wakefield_Data\projects\OLIN\Wilmington\South Ditch\Monthly Inspections\2014\September 2014\September 2014 Weir Inspection Report.doc]

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 9/5/2014 **Time** 1:00 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a normal level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G is covered with vegetation.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is mostly dry.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir and a low flow from the outlet pipe. The main area is lightly cloudy. The stream has a moderate flow of clear water.

The Hay bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site

Interim Action Plan
South and West Ditch Inspection Report

Date 9/12/2014 Time 10:15 Inspectors Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water.
	Station B		x	
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G vegetation is beginning to die for the winter.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is dry.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir and a low flow from the outlet pipe. The main area is lightly cloudy. The stream has a moderate flow of clear water. There is some light foaming at the check dams and near the foot bridge.

The Hay bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Inspection Report

Date 9/19/2014 **Time** 0:45 **Inspectors** Leroy Johnson

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Stn A has a low level of clear water.
	Station A		x	Stn B has a normal level of clear water. Area
	Station B		x	covered with Pine pollen.
West Ditch Foot Bridge				
	Station C		x	**Filled in**
Weir - Upstream				Stn D has a normal level of clear water.
	Station D	x		
Weir - Downstream				Stations E & F have a low flow of clear water.
	Station E	x		
	Station F	x		
	Station G	x		Stn G vegetation is beginning to die for the winter.
Unnamed Ditch				Stn H is saturated soil.
	Station H		x	Stn I is dry.
	Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Hay bale Barriers: There is no flow from the weir and a low flow from the outlet pipe. The main area is lightly cloudy. The stream has a moderate flow of clear water. There is some light foaming at the check dams and near the foot bridge. The stream surface and banks are covered with Pine pollen.

The Hay bale line has a trickle flow of clear water.

Olin Corporation
Wilmington Site
Interim Action Plan
South and West Ditch Precipitate Inspection Report

Date: 9/26/2014 **Time:** 9:30 **Inspectors:** Brian Roden

Station		Precipitate Observation		Other Observations
		Yes	No	
Offsite Fenced Ditch System				Station A is almost dry with some standing water.
	Station A		X	Station B has a low level of clear water.
	Station B		X	
West Ditch Foot Bridge				**Filled in**
	Station C			
Weir - Upstream				Station D has a low level of clear water.
	Station D		X	
Weir - Downstream				Stations E and F have a low flow of slightly
	Station E	X		cloudy water with some foaming .
	Station F	X		Station G is covered with vegetation.
	Station G		X	
Unnamed Ditch				Station H is dry.
	Station H		X	Station I is dry.
	Station I		X	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				

Condition of Weir / Haybale Barriers: There is a no flow from the plant B outlet pipe and no flow from the weir outlet pipe. The main area has a low level of slightly cloudy water. A brown or rust color is visible on the bottom.

The haybale line is dry.

APPENDIX D

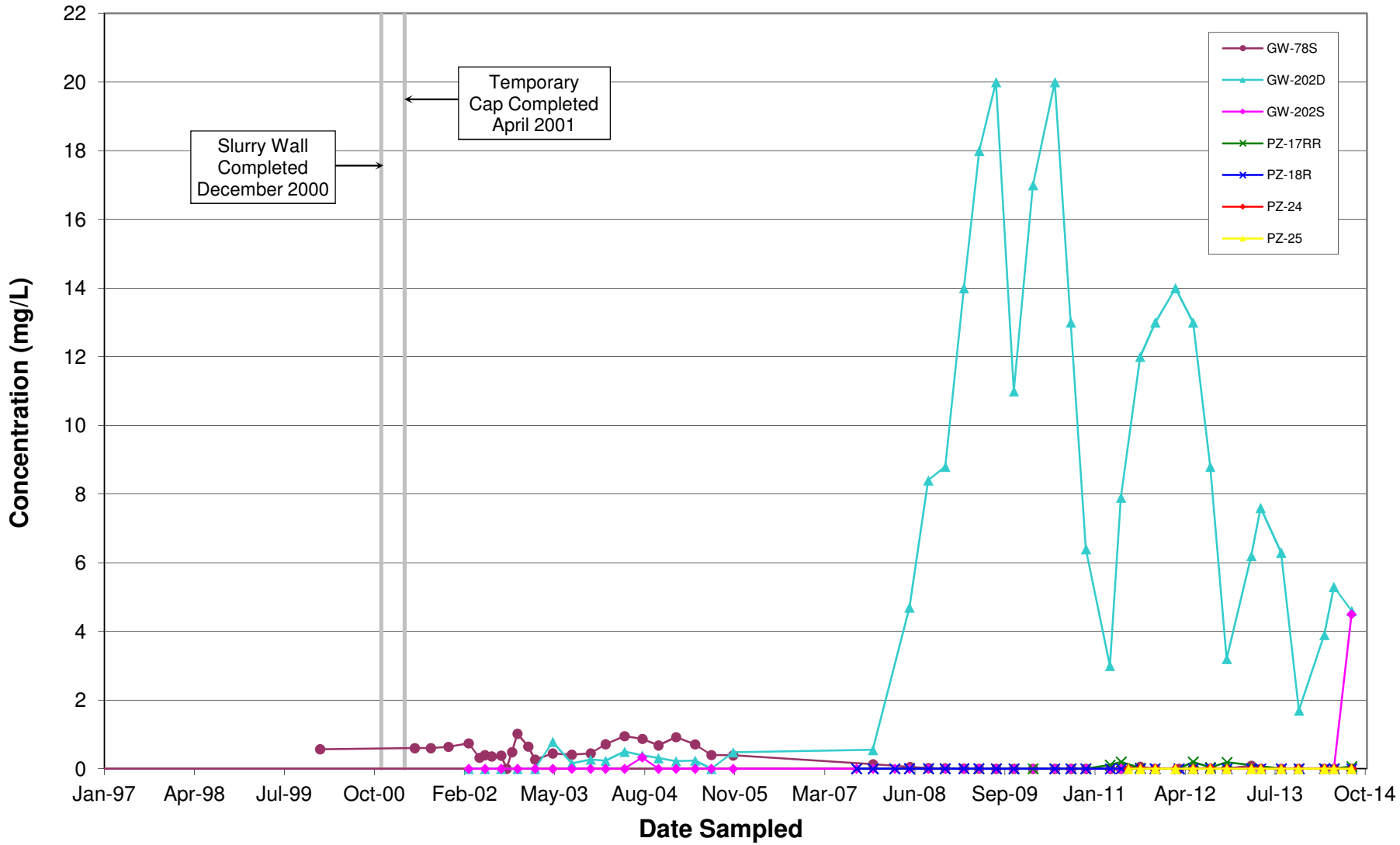
Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)
D-2 Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)

APPENDIX D

Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

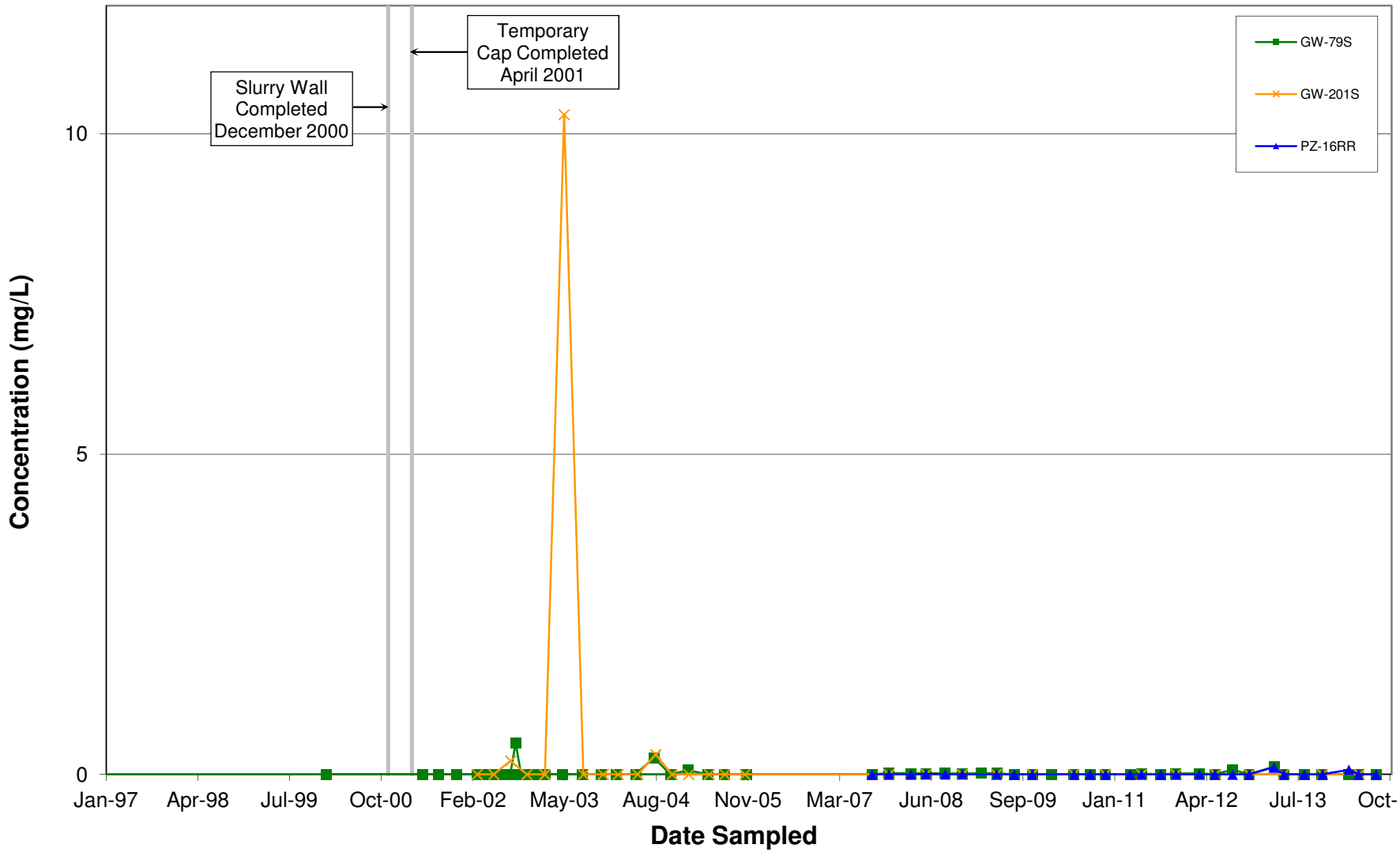
D-1 Groundwater (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Filtered Aluminum in Groundwater South of Containment Structure Figure D-1.1

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW S

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



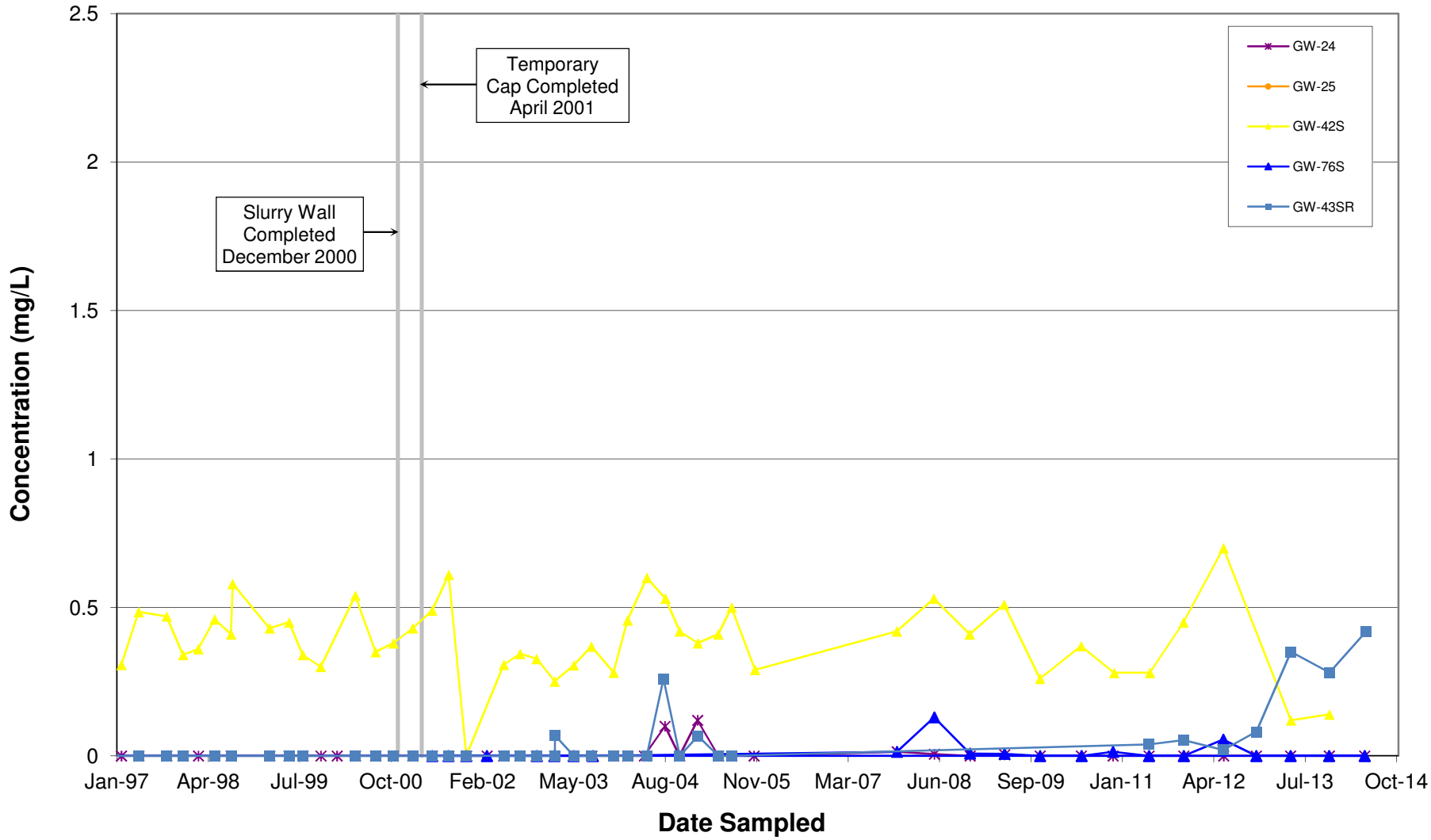
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Filtered Aluminum in Groundwater
Southeast of Containment Structure

Figure D-1.2

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW SE

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

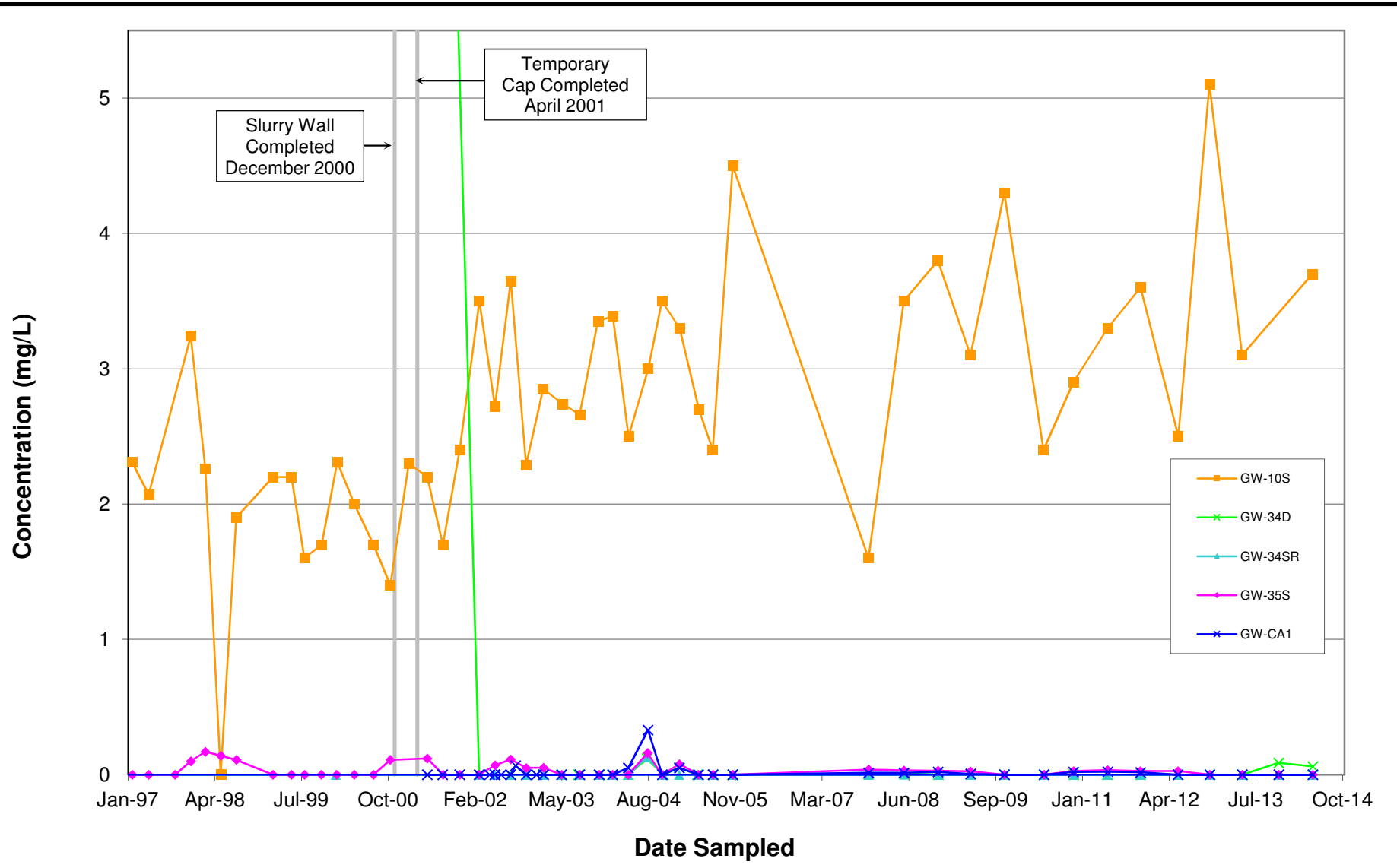
amec

Filtered Aluminum in Groundwater
West of Containment Structure

Figure D-1.3

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW W

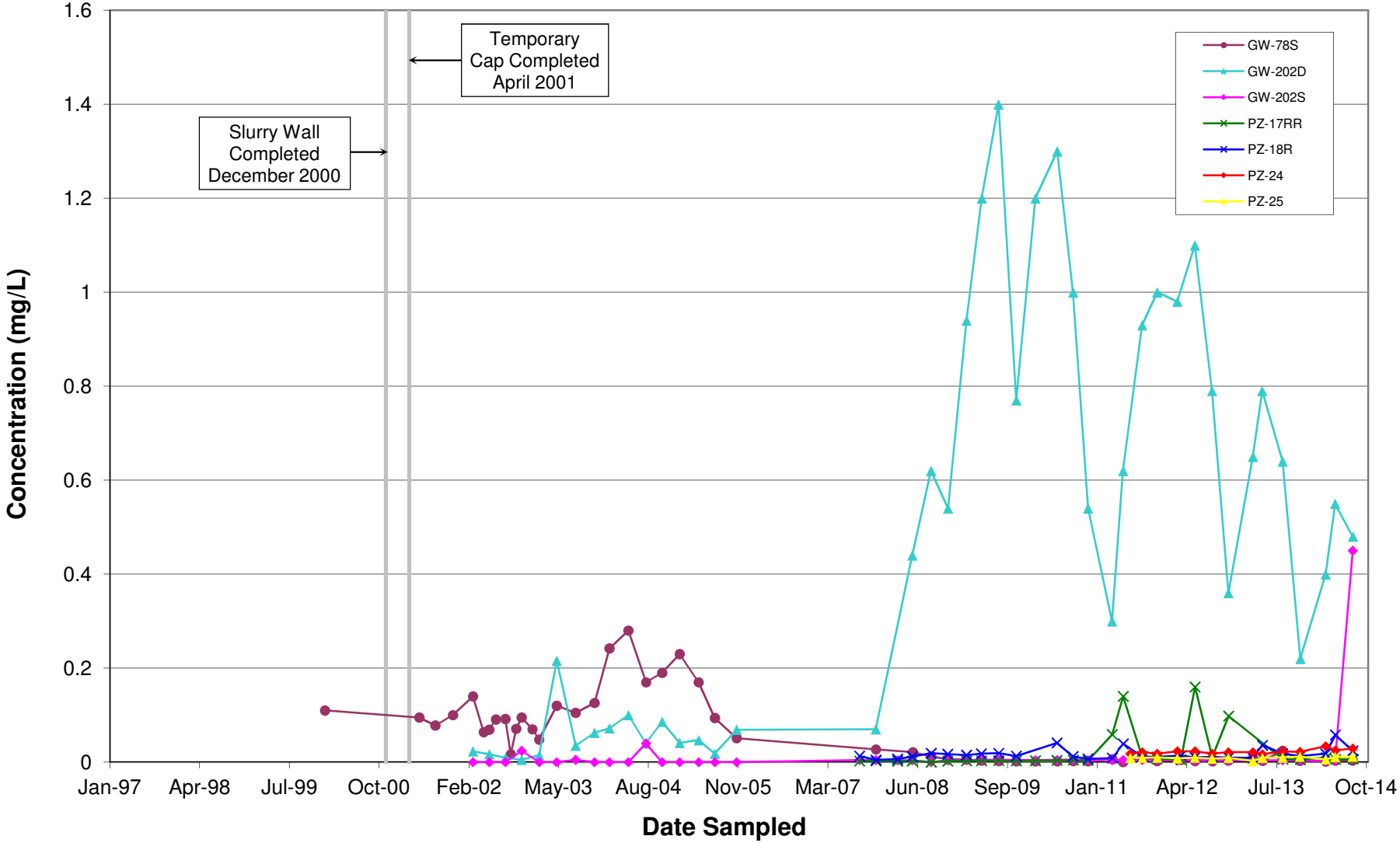
Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Filtered Aluminum in Groundwater North of Containment Structure Figure D-1.4

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

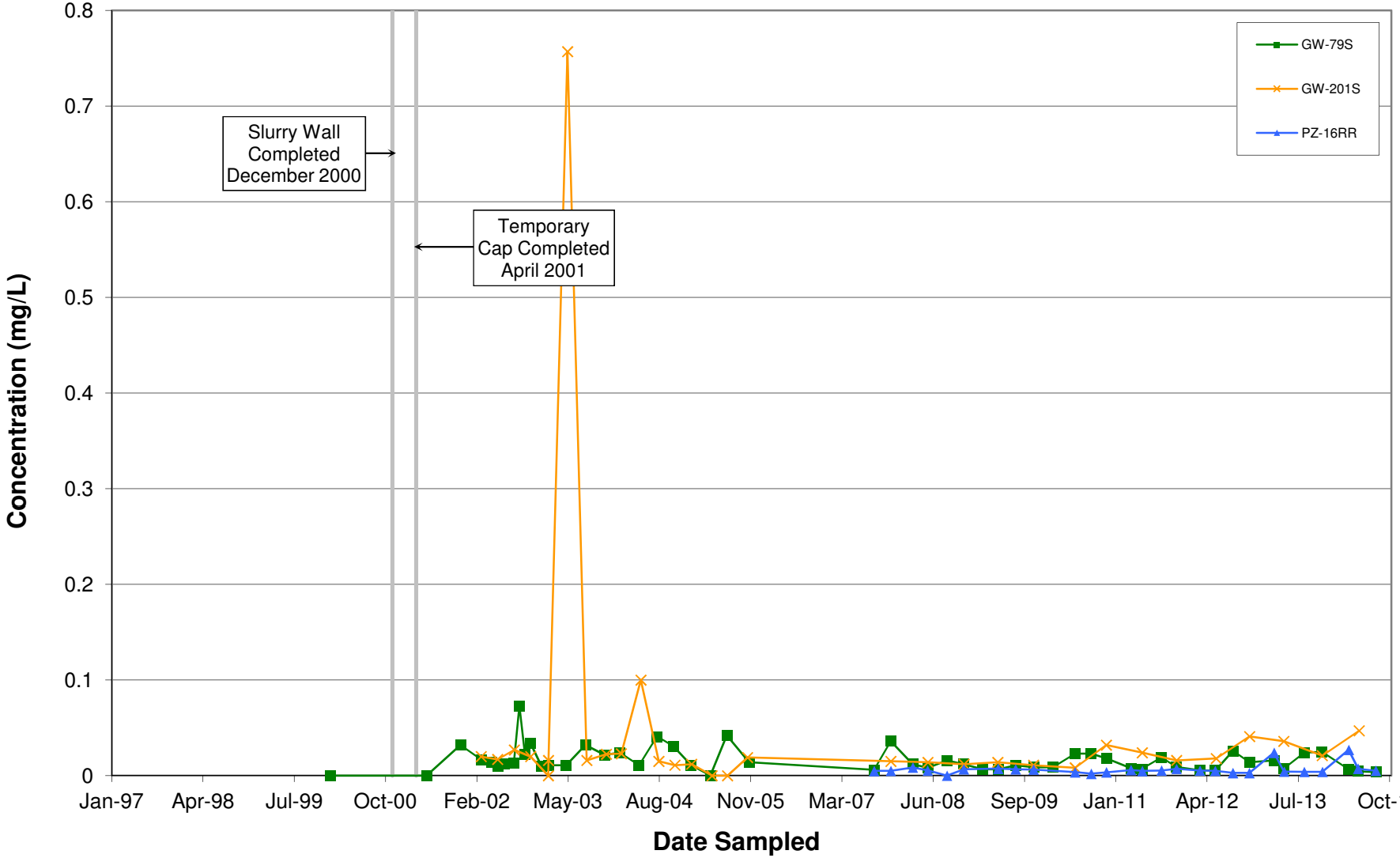
amec

Filtered Chromium in Groundwater
South of Containment Structure

Figure D-1.5

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW S

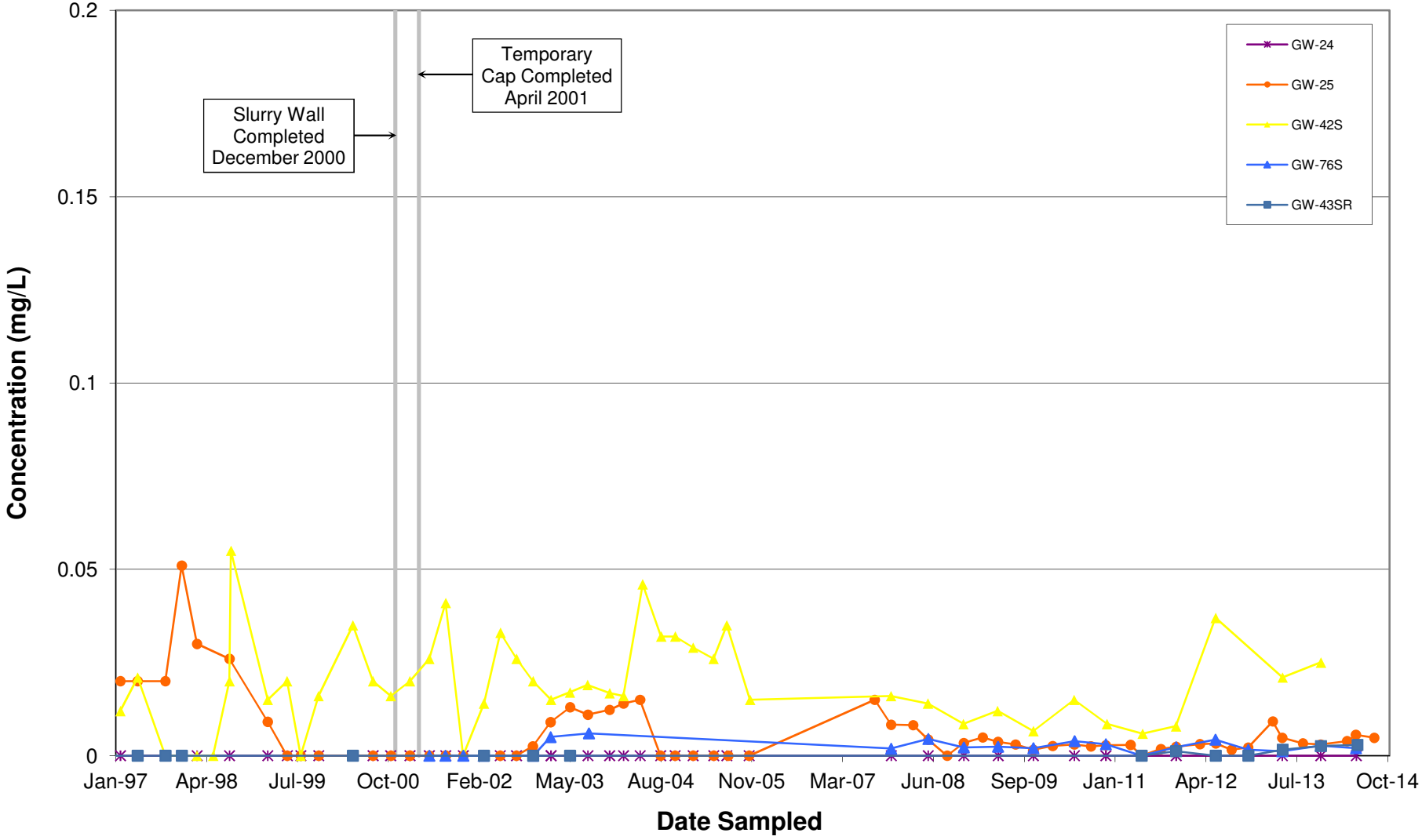
Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Filtered Chromium in Groundwater Southeast of Containment Structure Figure D-1.6

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW SE

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

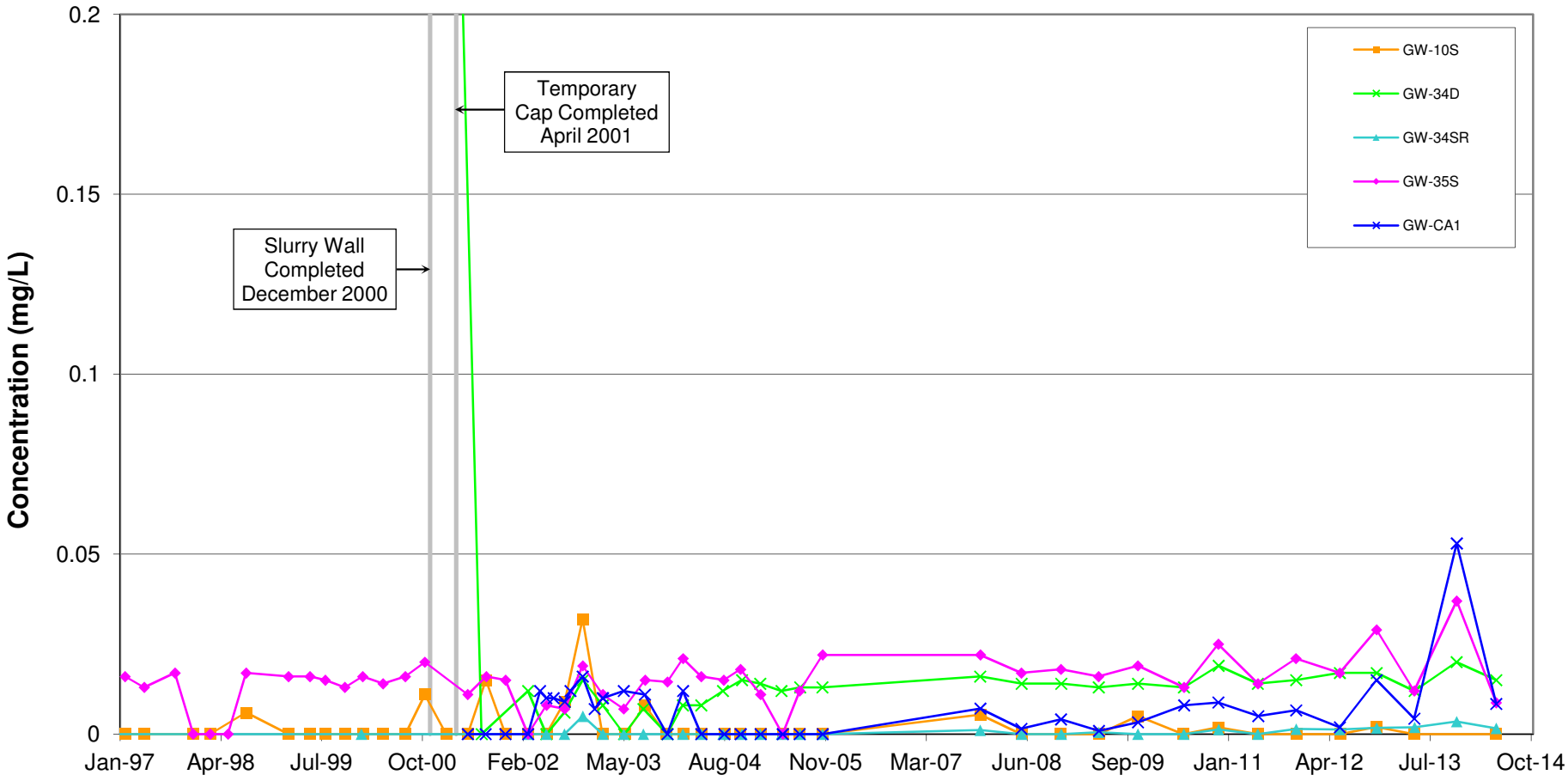
amec

Filtered Chromium in Groundwater
West of Containment Structure

Figure D-1.7

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW W

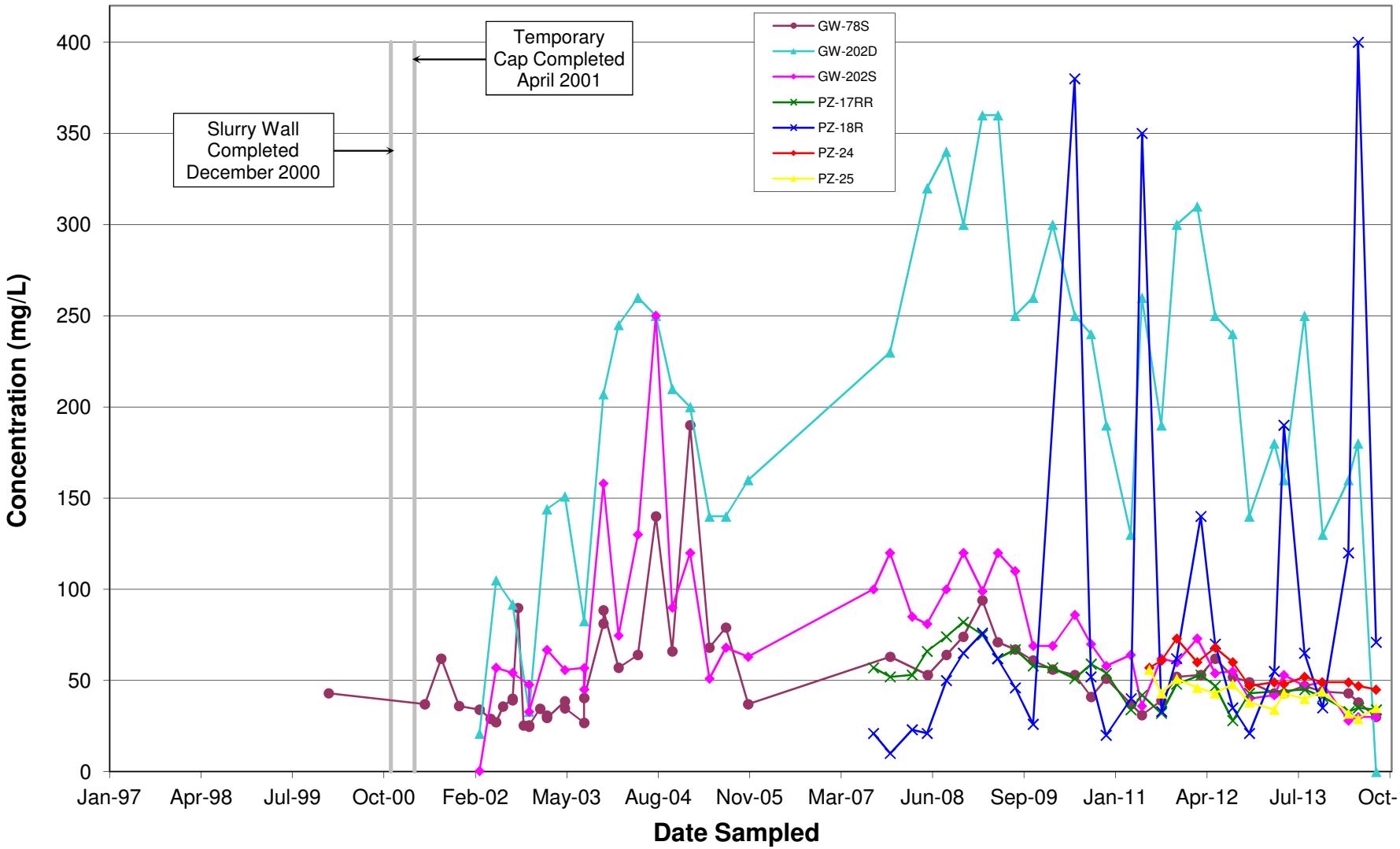
Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Filtered Chromium in Groundwater North of Containment Structure Figure D-1.8

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

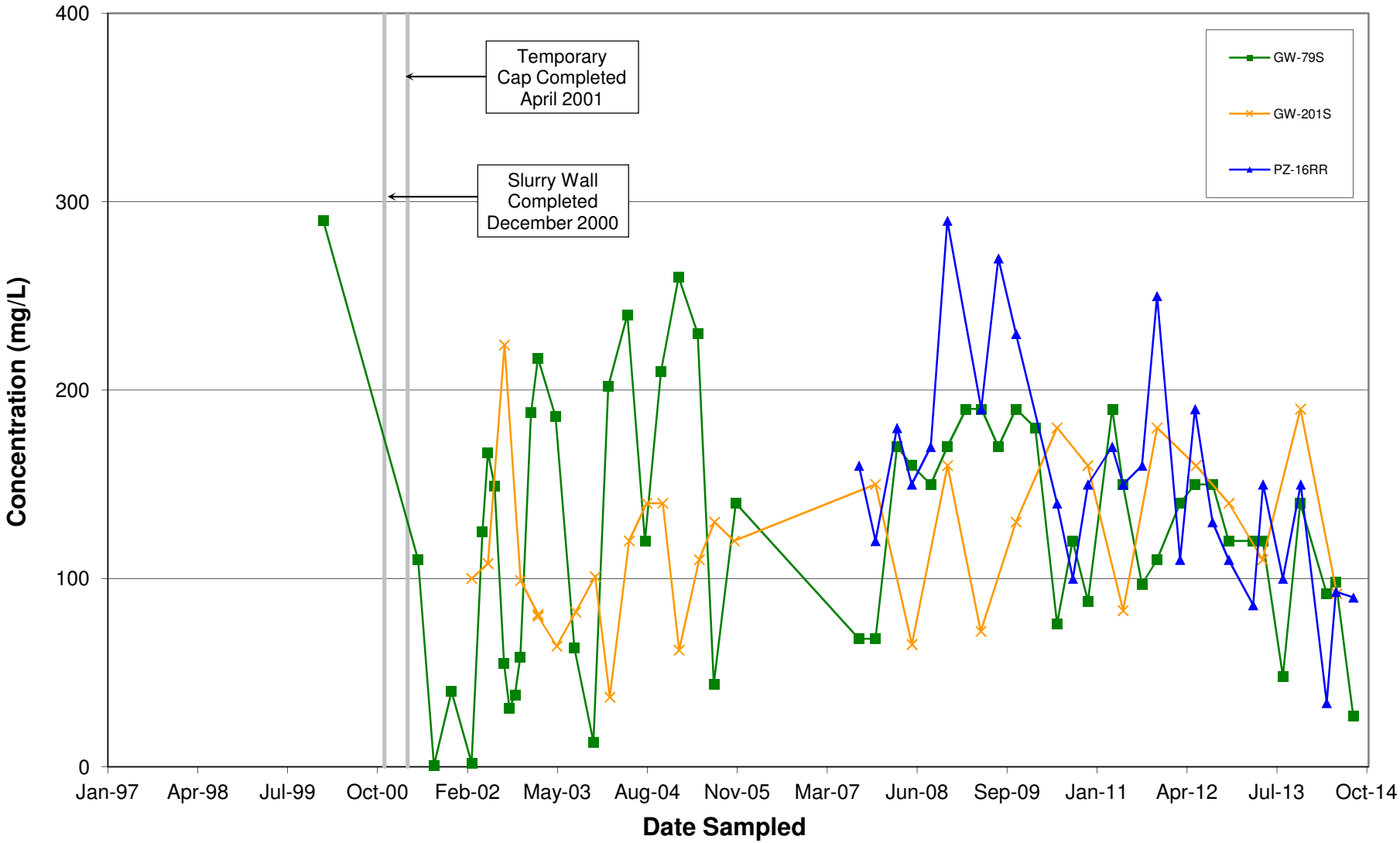
amec

Ammonia in Groundwater
South of Containment Structure

Figure D-1.9

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW S

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

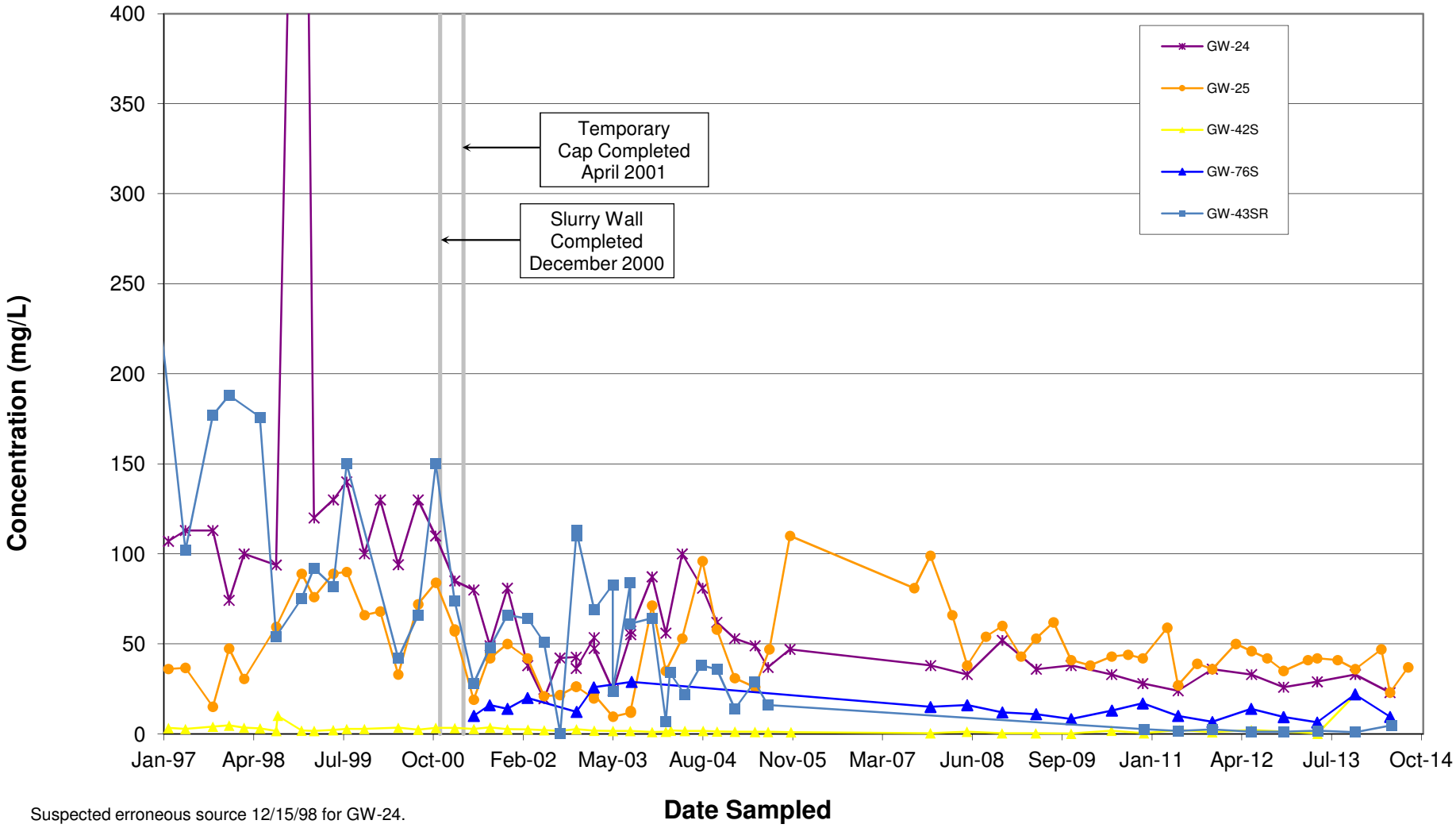
amec

Ammonia in Groundwater
Southeast of Containment Structure

Figure D-1.10

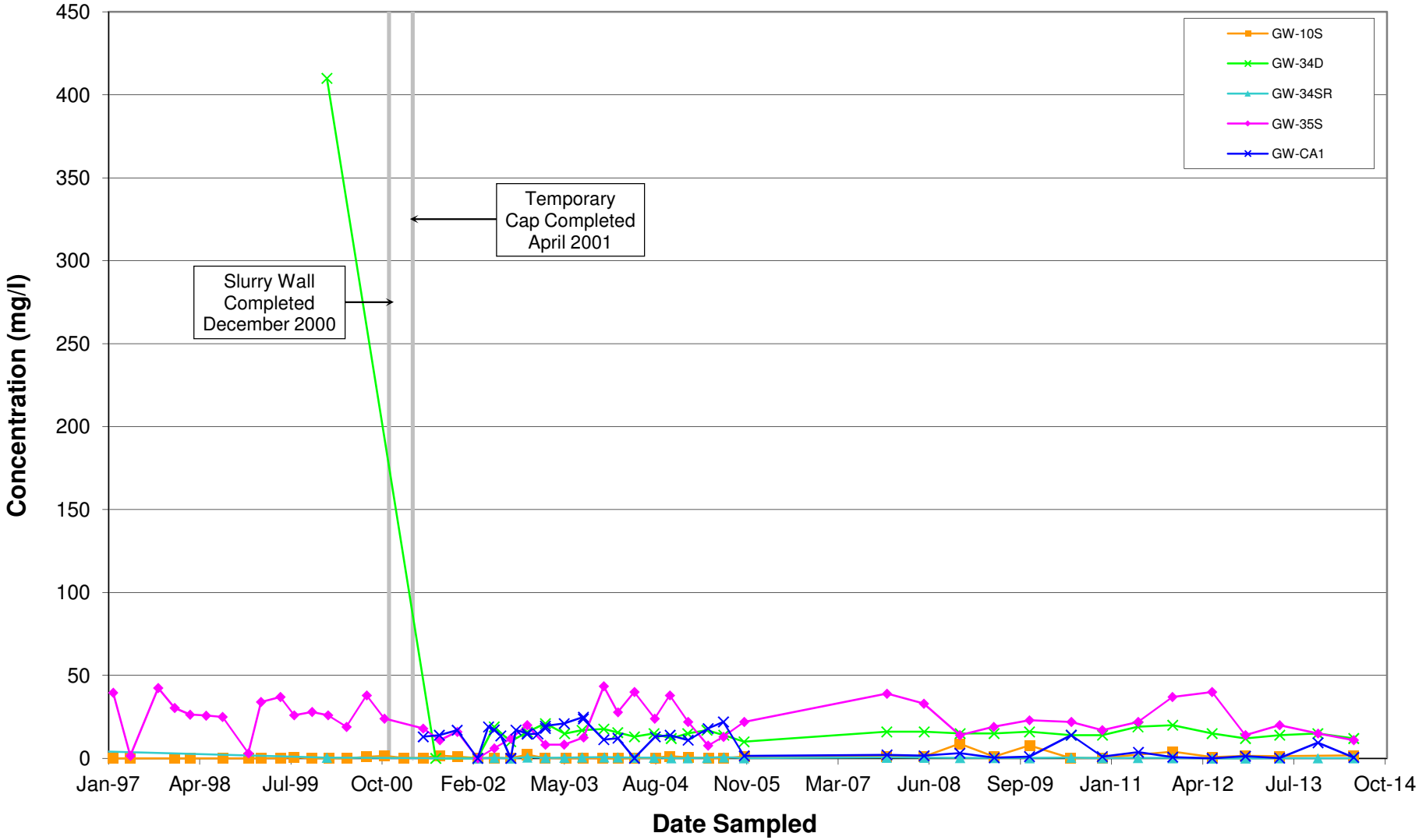
\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW SE

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Suspected erroneous source 12/15/98 for GW-24.

Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Ammonia in Groundwater West of Containment Structure Figure D-1.11



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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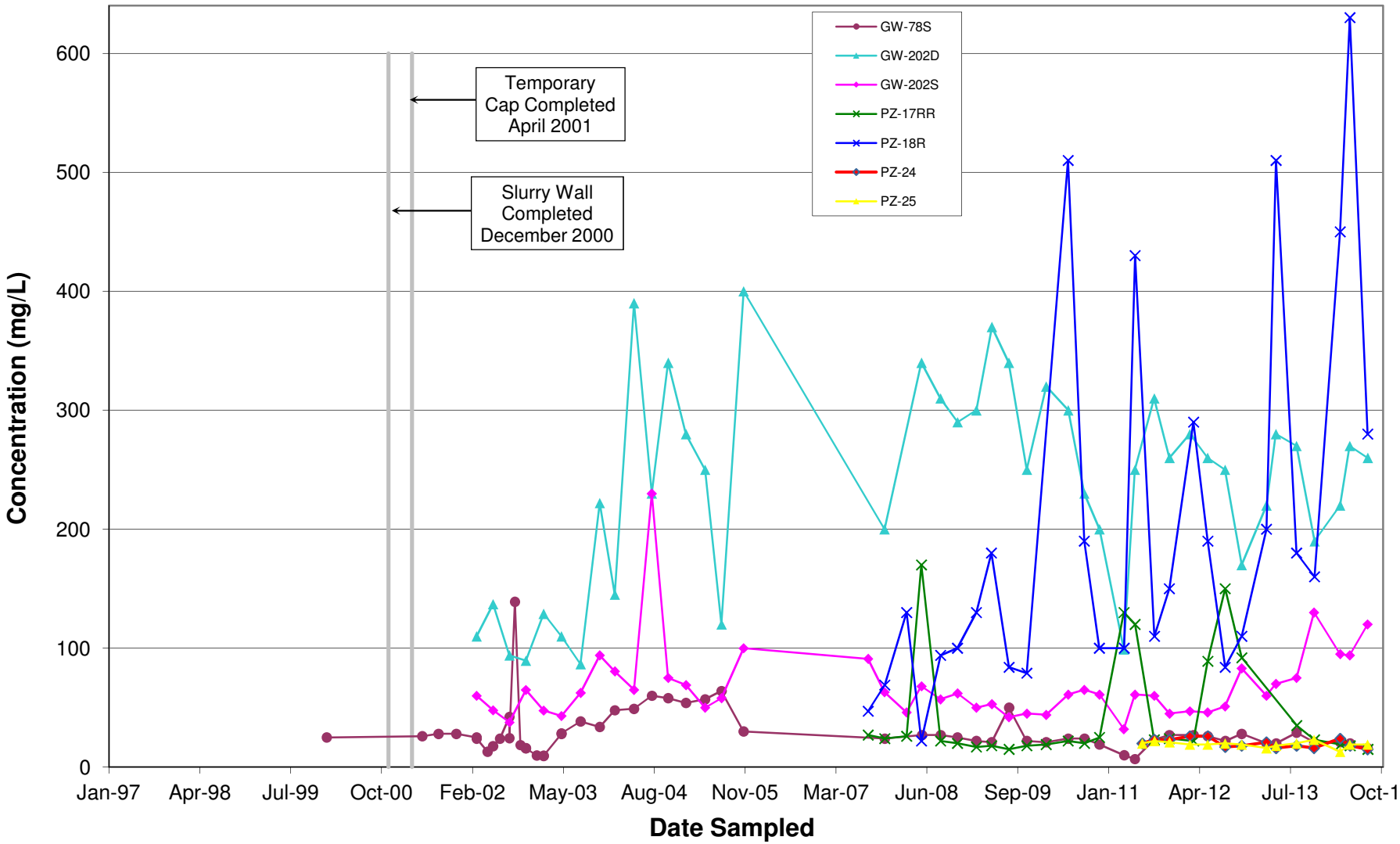
Ammonia in Groundwater
North of Containment Structure

Figure D-1.12

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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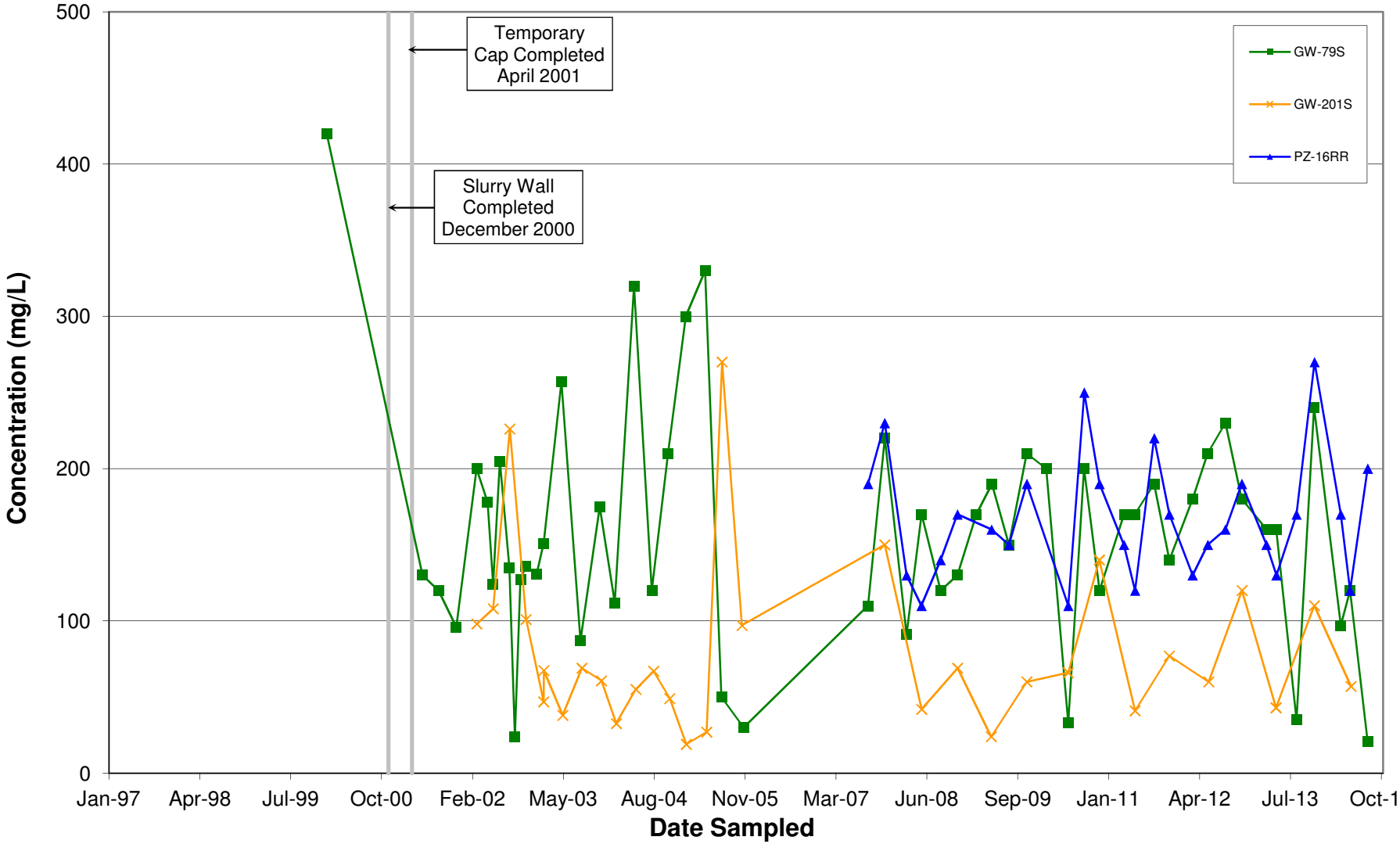
Chloride in Groundwater
South of Containment Structure

Figure D-1.13

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW S

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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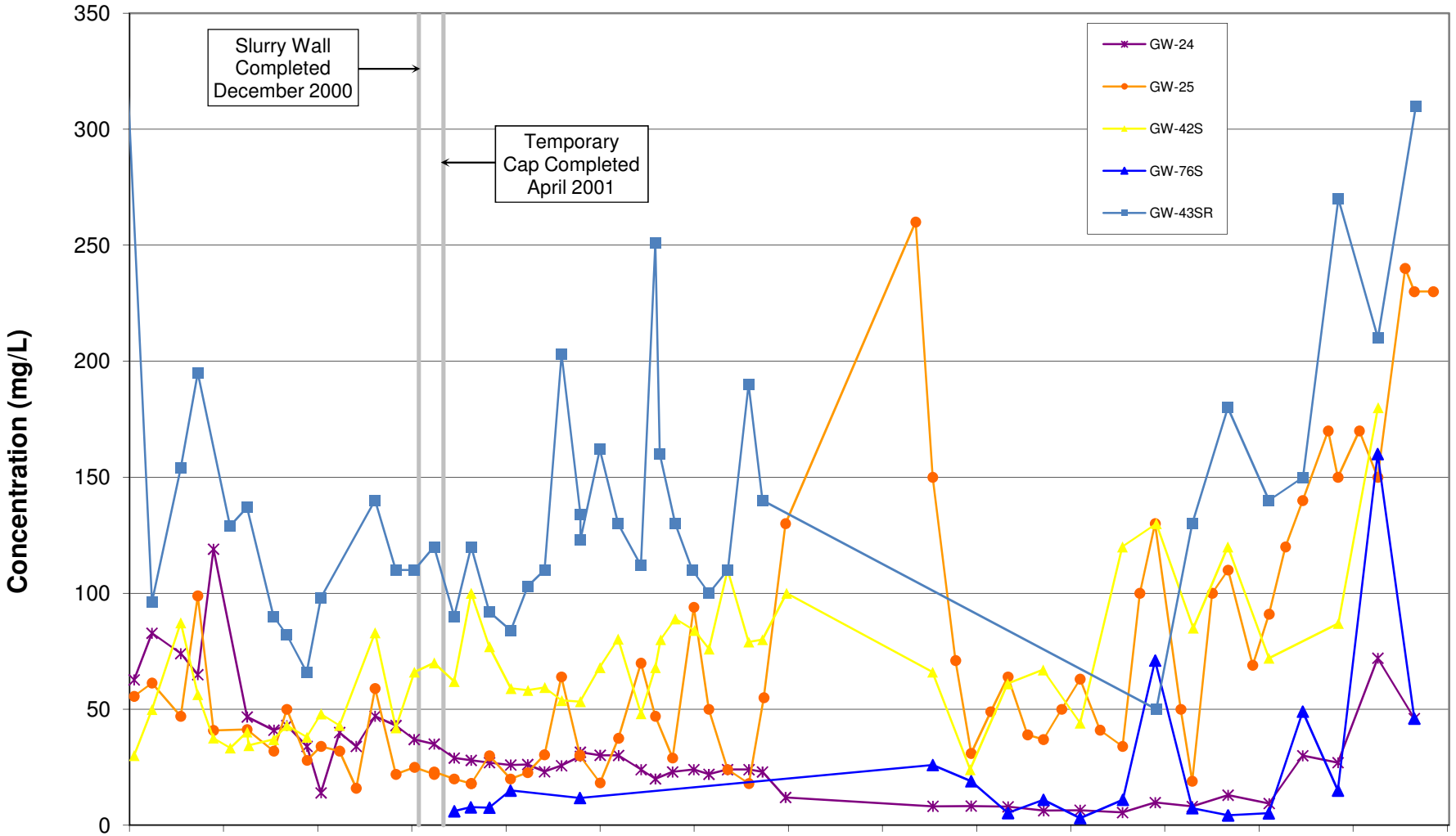
Chloride in Groundwater
Southeast of Containment Structure

Figure D-1.14

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW SE

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

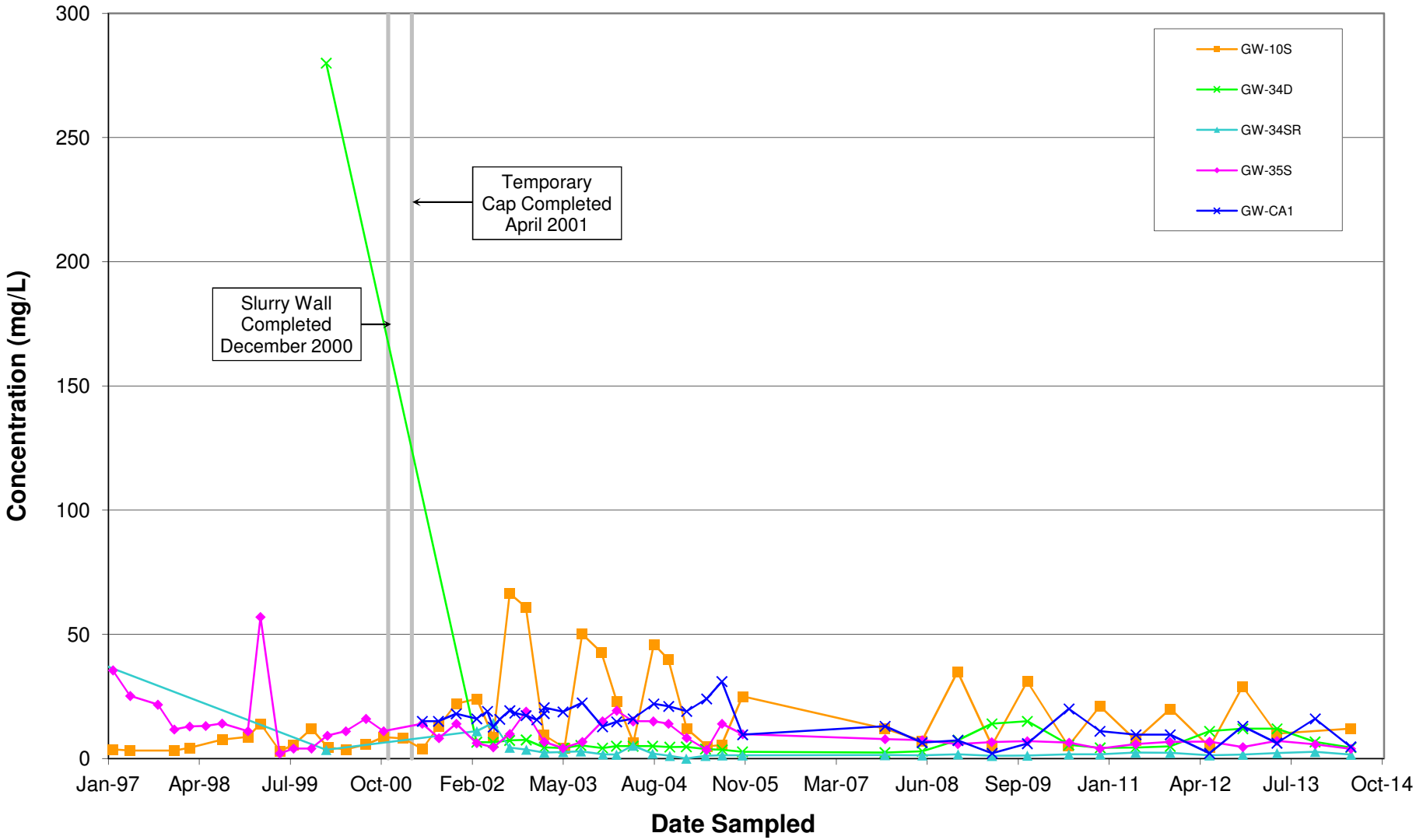
amec

Chloride in Groundwater
West of Containment Structure

Figure D-1.15

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW W

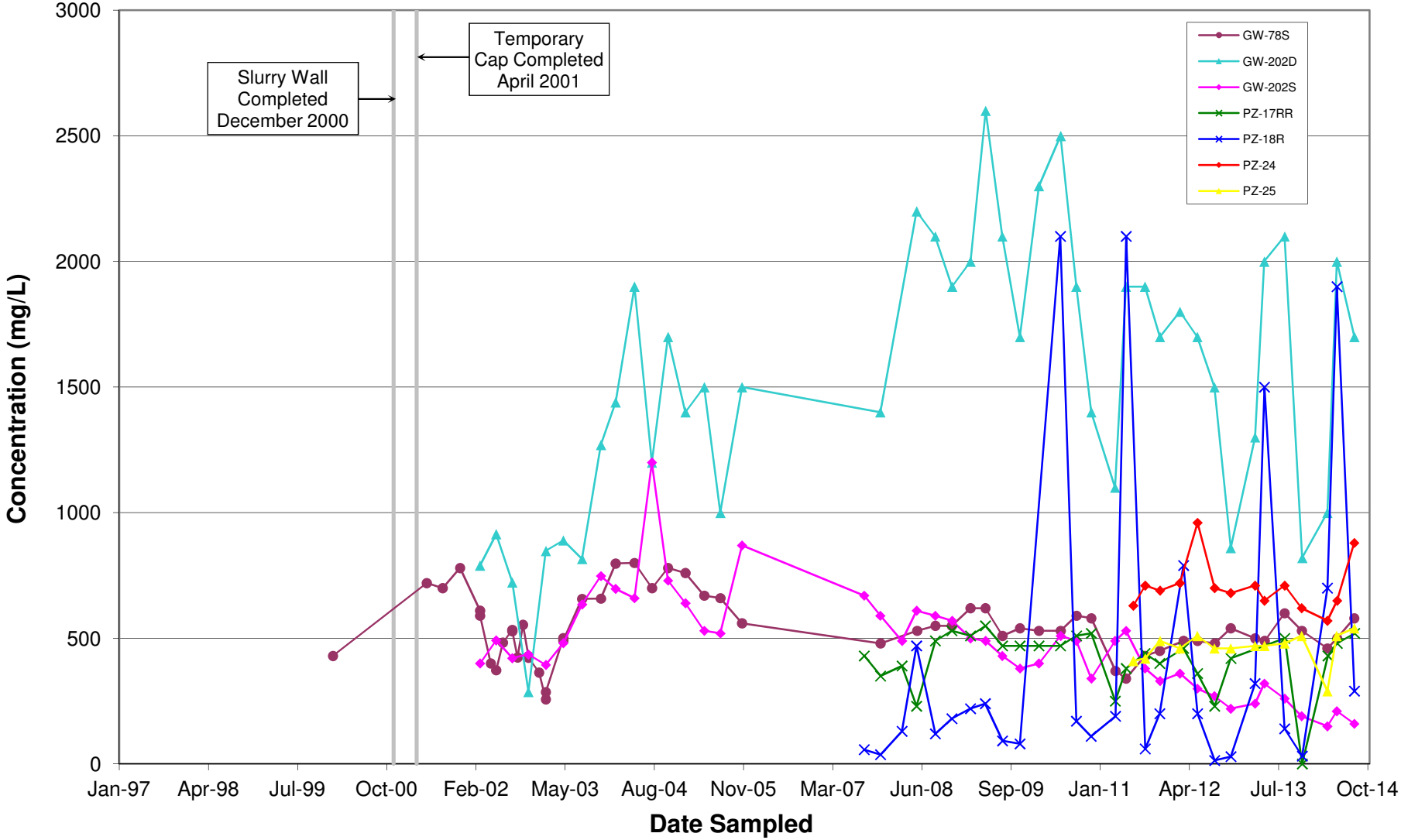
Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15 Olin Chemical Superfund Site Wilmington, Massachusetts	amec	Chloride in Groundwater North of Containment Structure Figure D-1.16

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

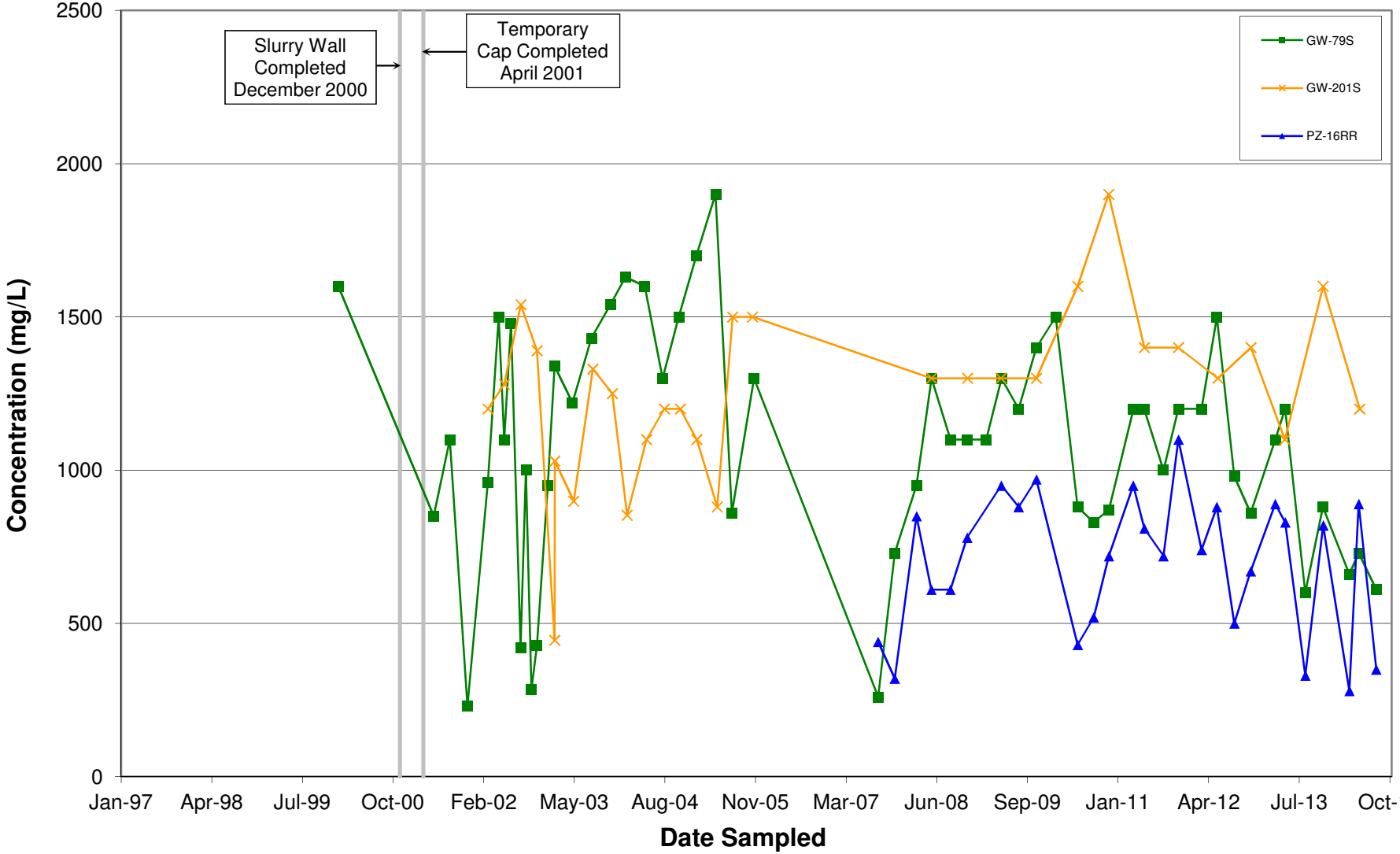
amec

Sulfate in Groundwater
South of Containment Structure

Figure D-1.17

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW S

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



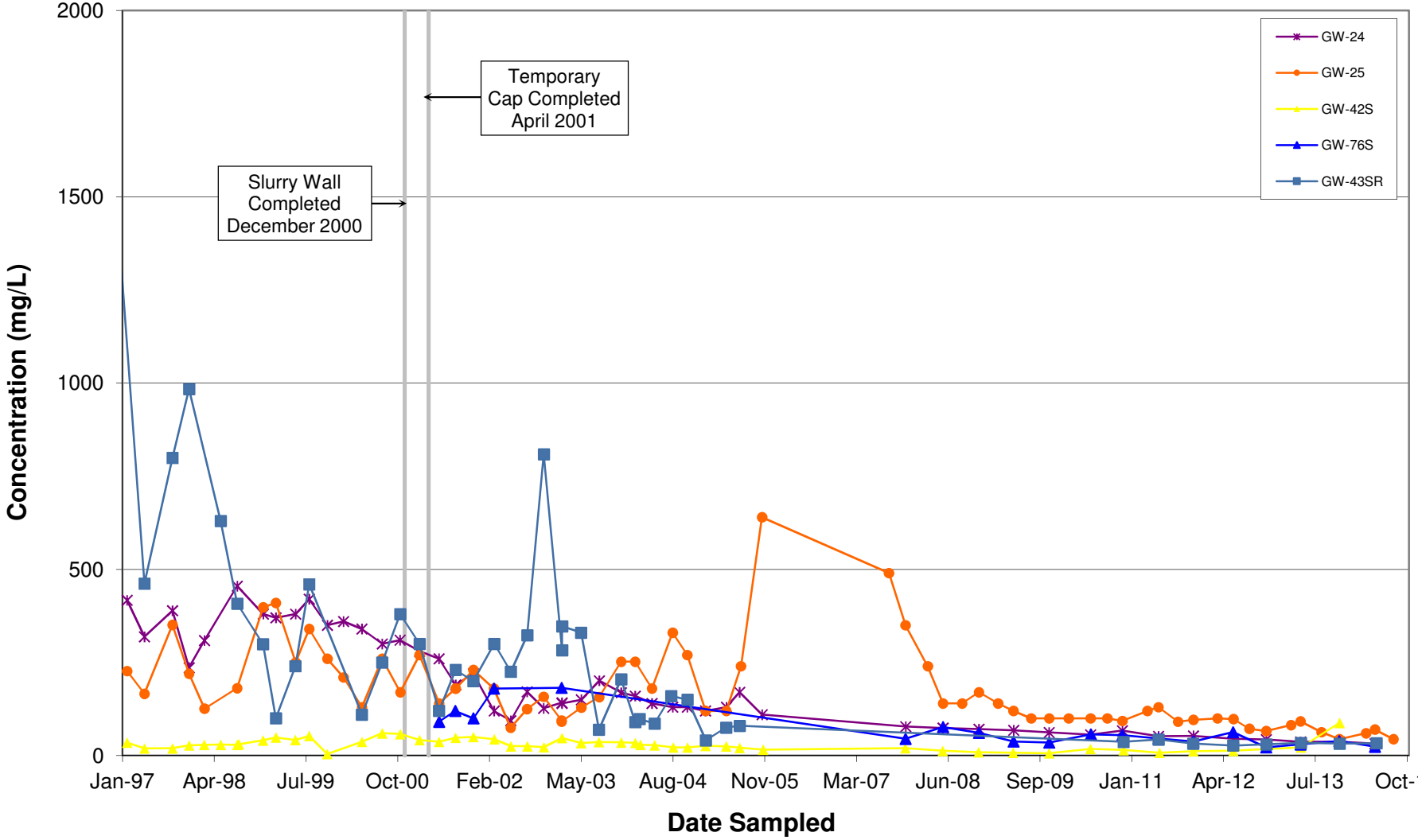
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sulfate in Groundwater
Southeast of Containment Structure

Figure D-1.18

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW SE

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



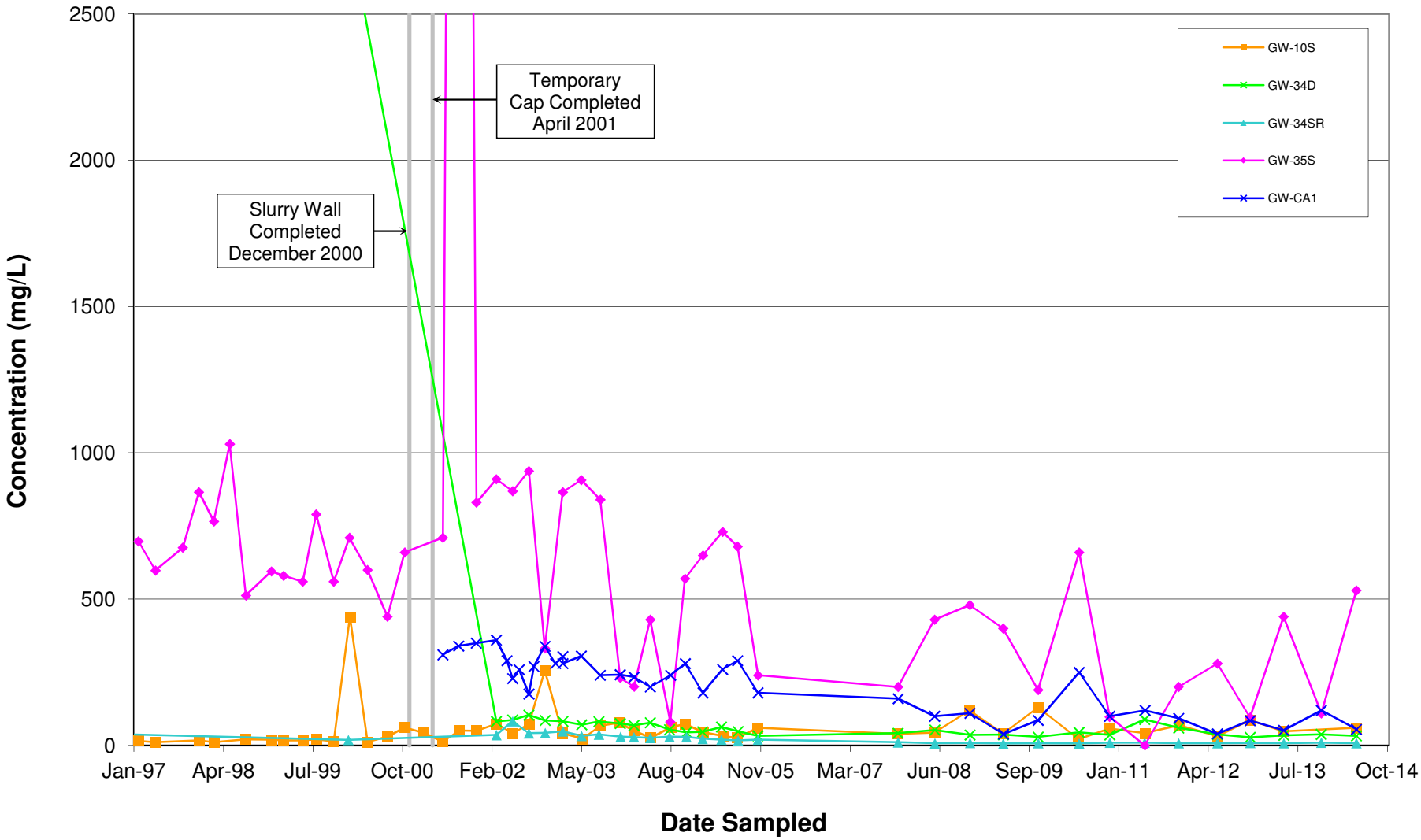
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Sulfate in Groundwater
West of Containment Structure

Figure D-1.19

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW W

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

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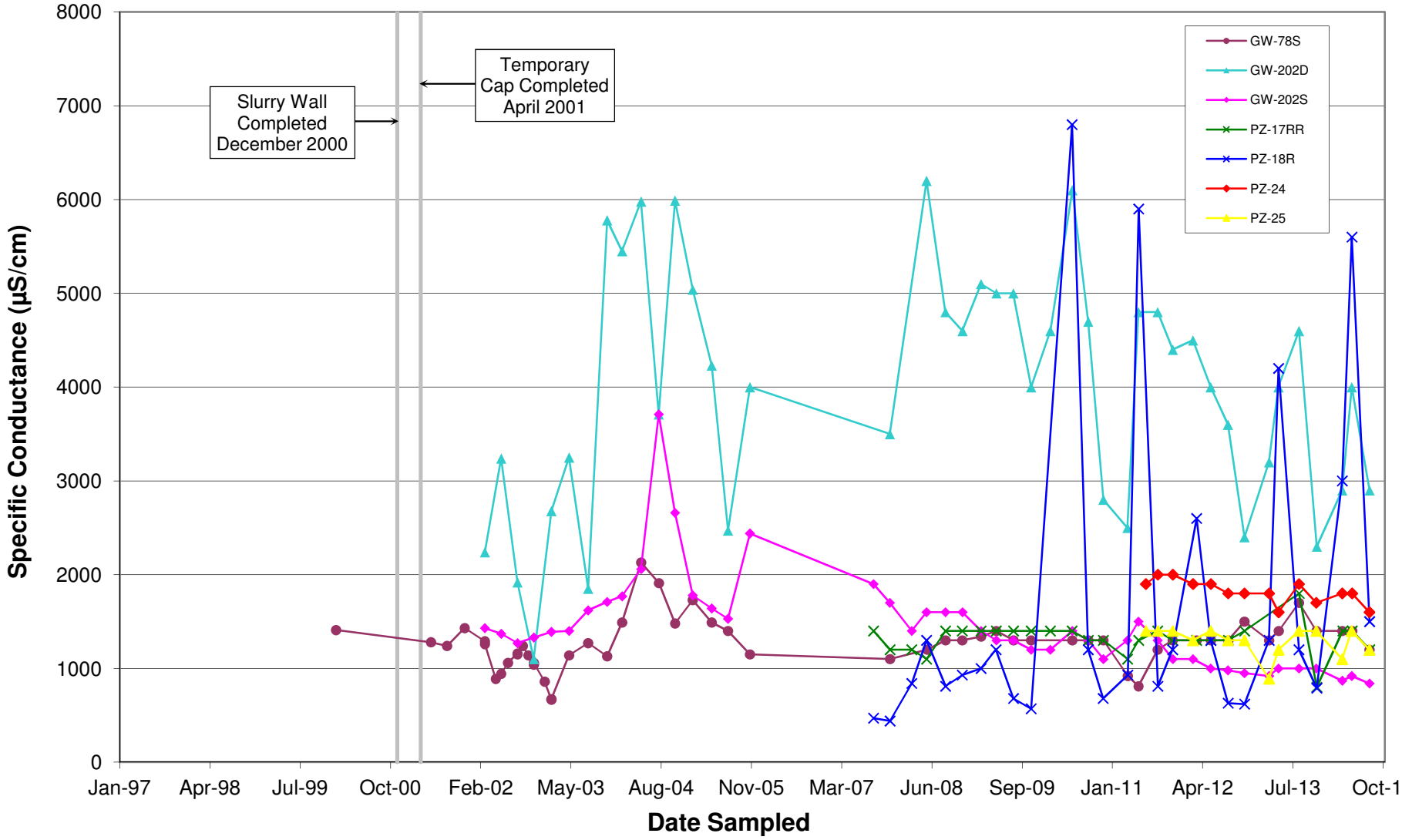
Sulfate in Groundwater
North of Containment Structure

Figure D-1.20

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

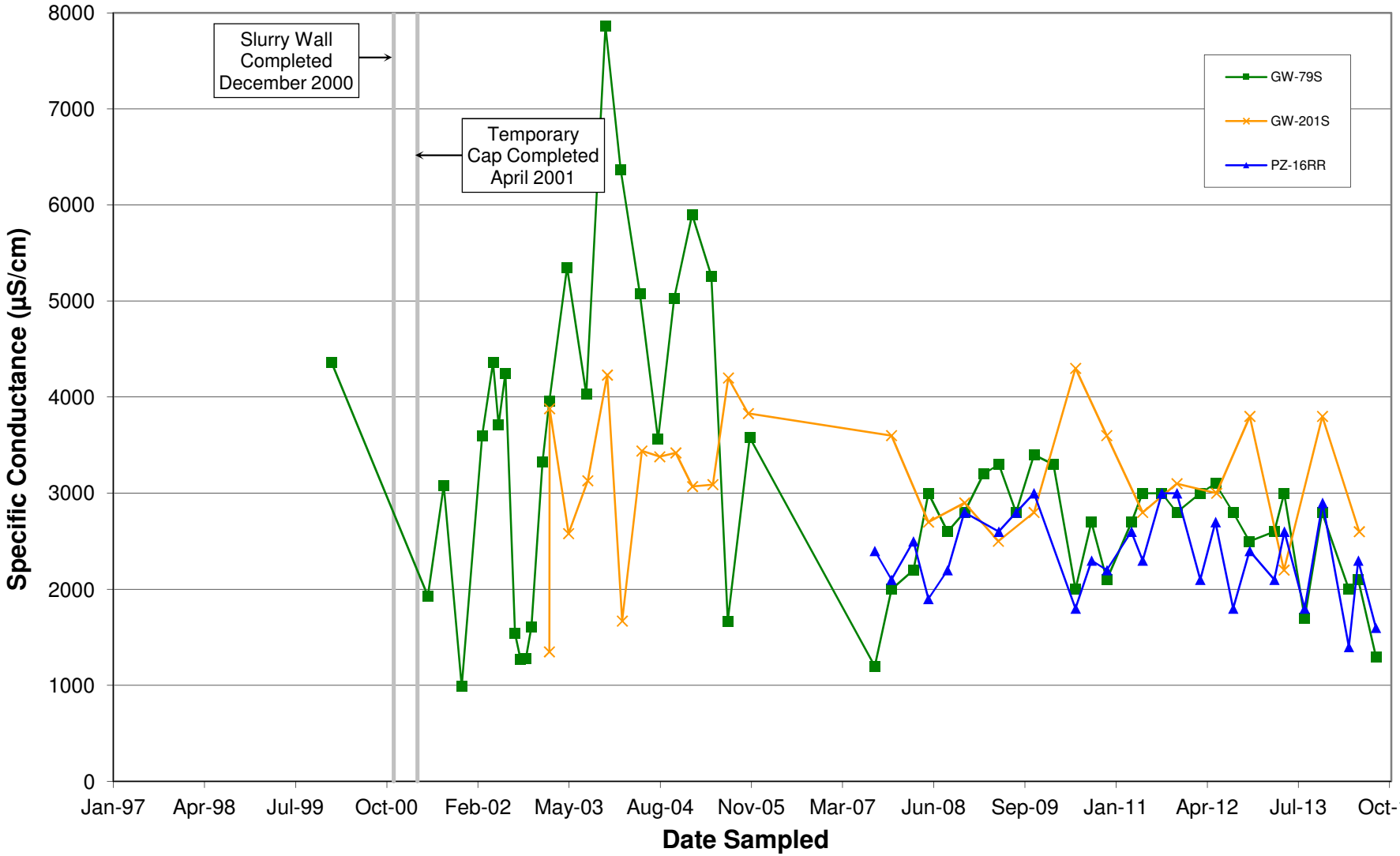
amec

Specific Conductance in Groundwater
South of Containment Structure

Figure D-1.21

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW S

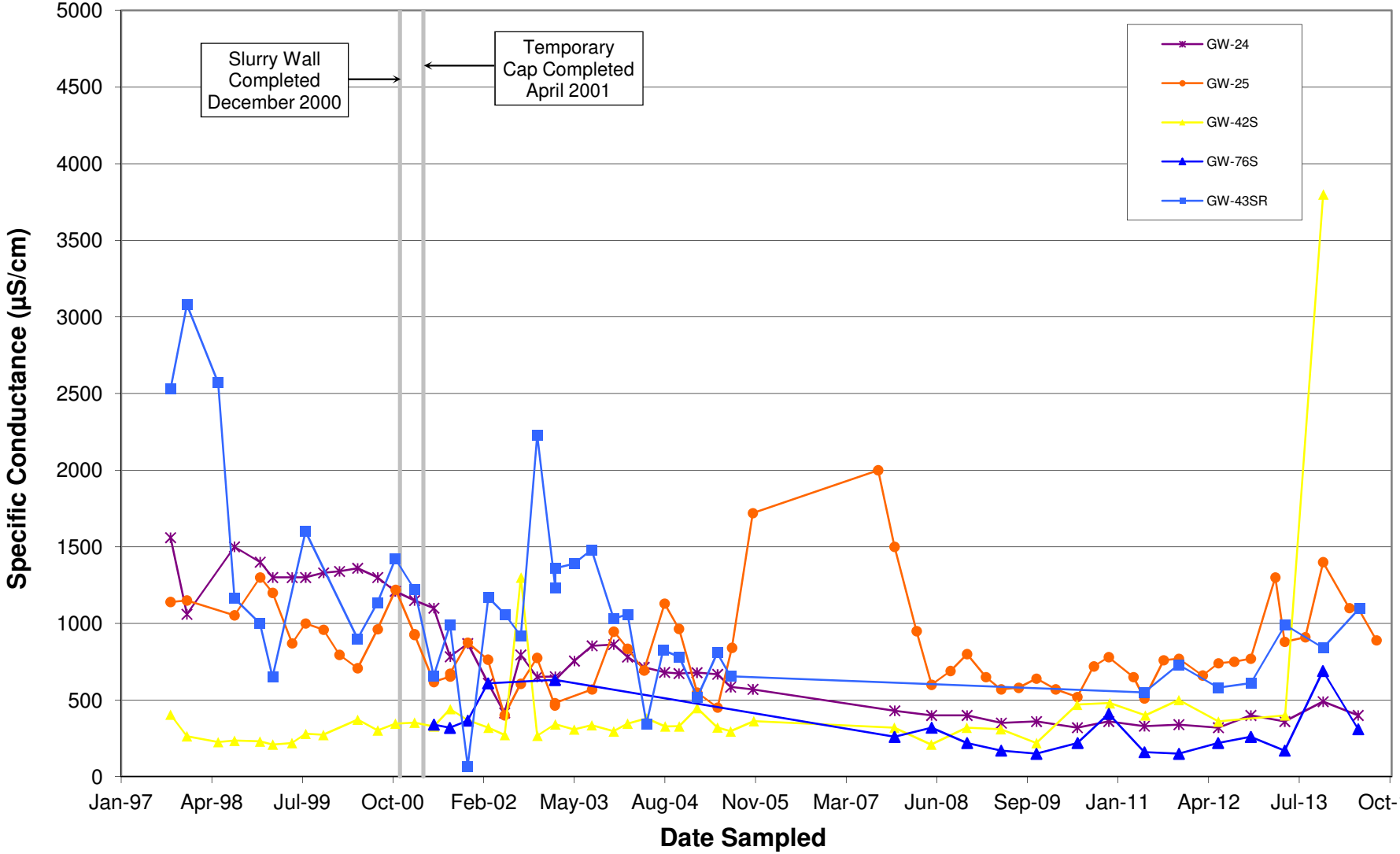
Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Specific Conductance in Groundwater
Southeast of Containment Structure

Figure D-1.22



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

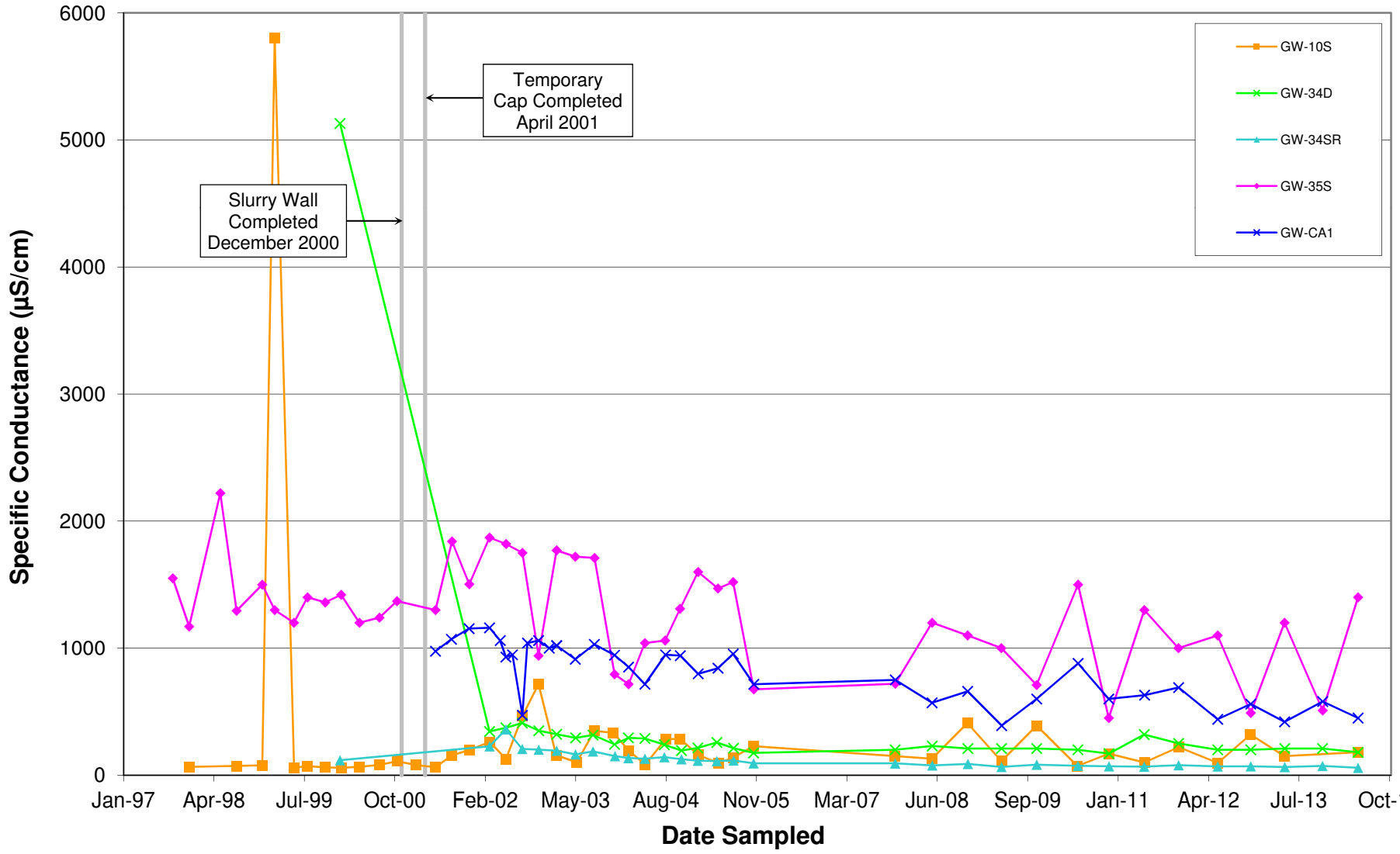
amec

Specific Conductance in Groundwater
West of Containment Structure

Figure D-1.23

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW W

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

amec

Specific Conductance in Groundwater
North of Containment Structure

Figure D-1.24

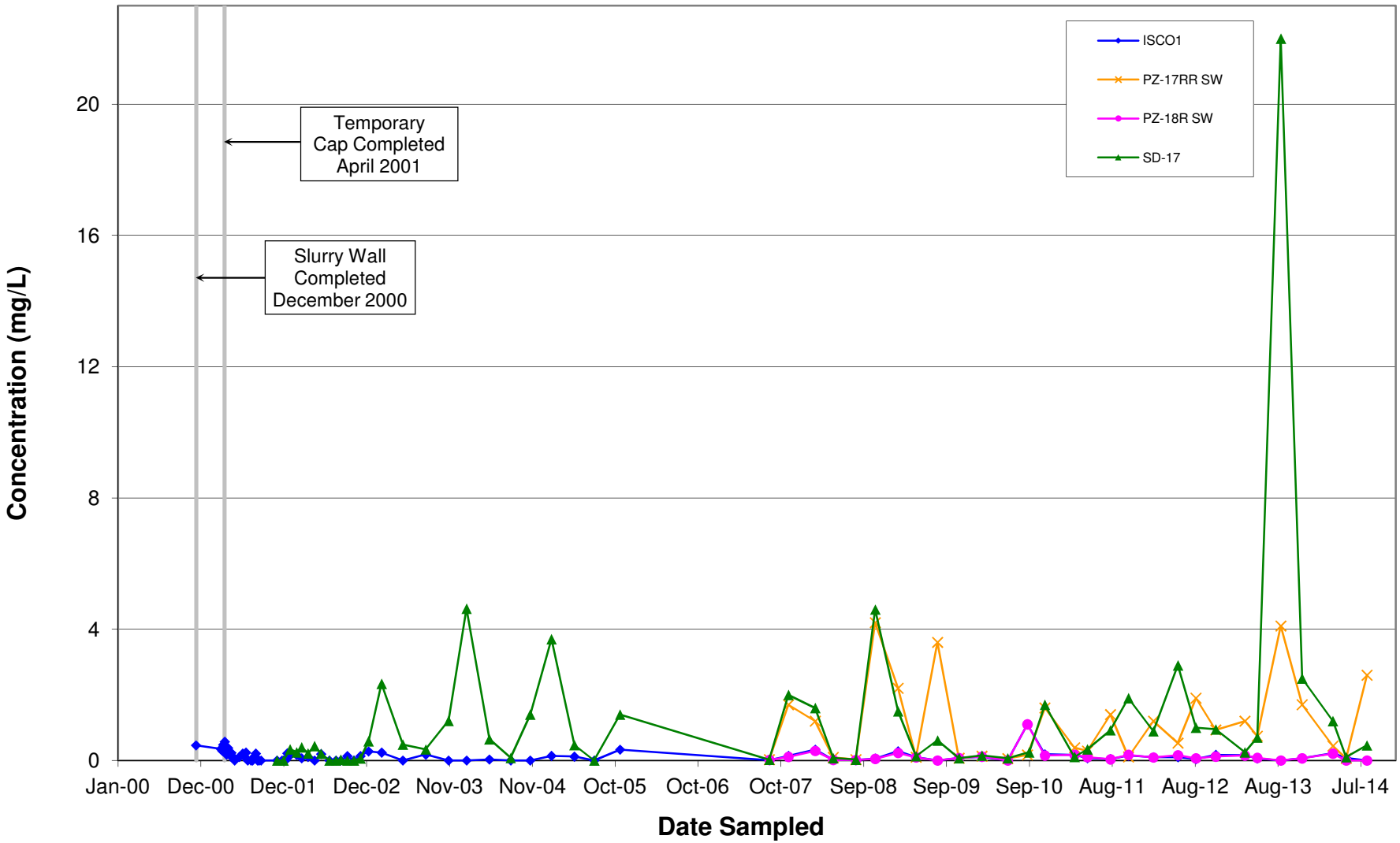
\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance GW N

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014

APPENDIX D

Slurry Wall/Cap Groundwater and Surface Water Time Series Plots

D-2 Surface Water (Aluminum, Ammonia, Chloride, Chromium, Sulfate)



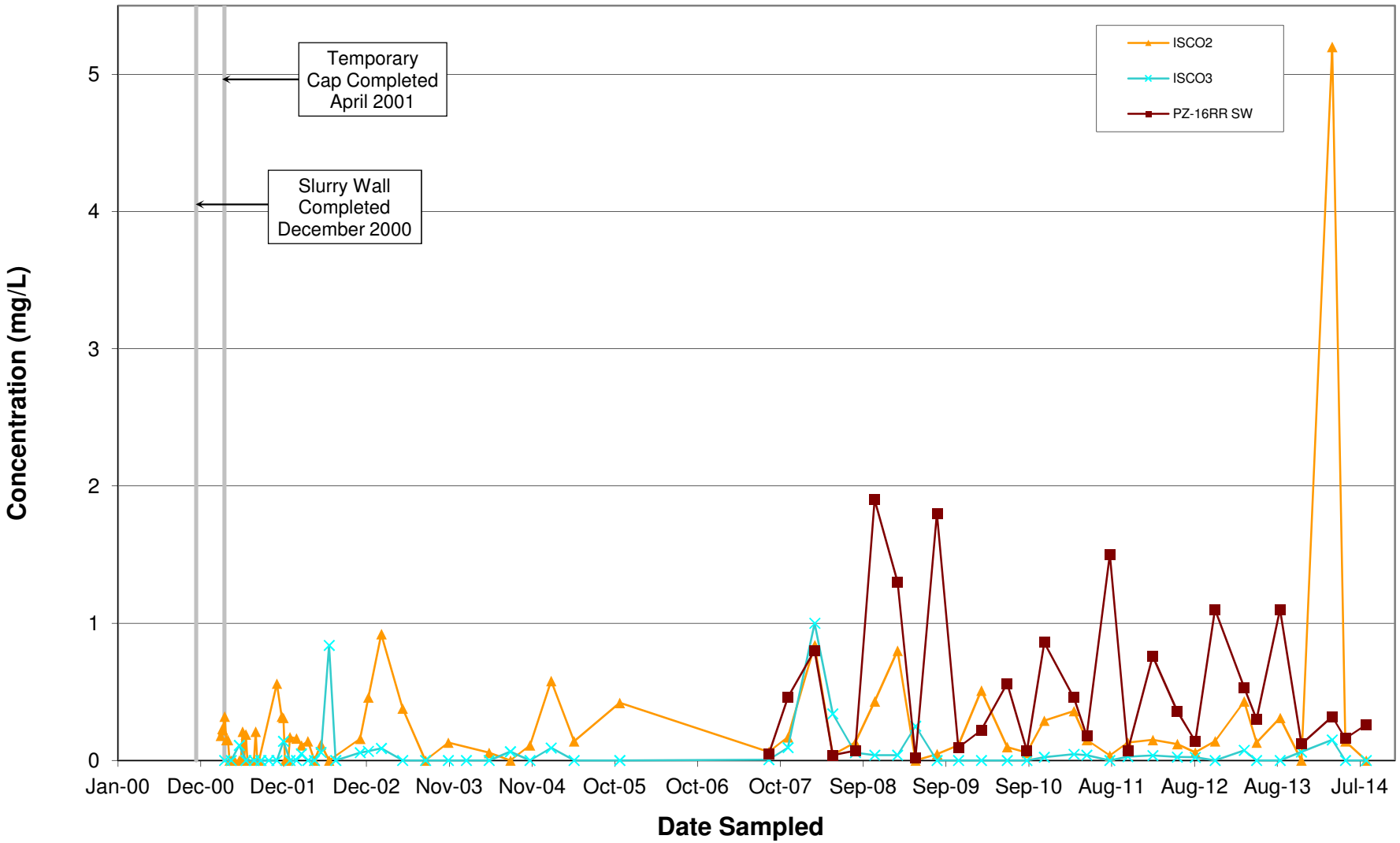
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Filtered Aluminum in Surface Water
in the Upper South Ditch

Figure D-2.1

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



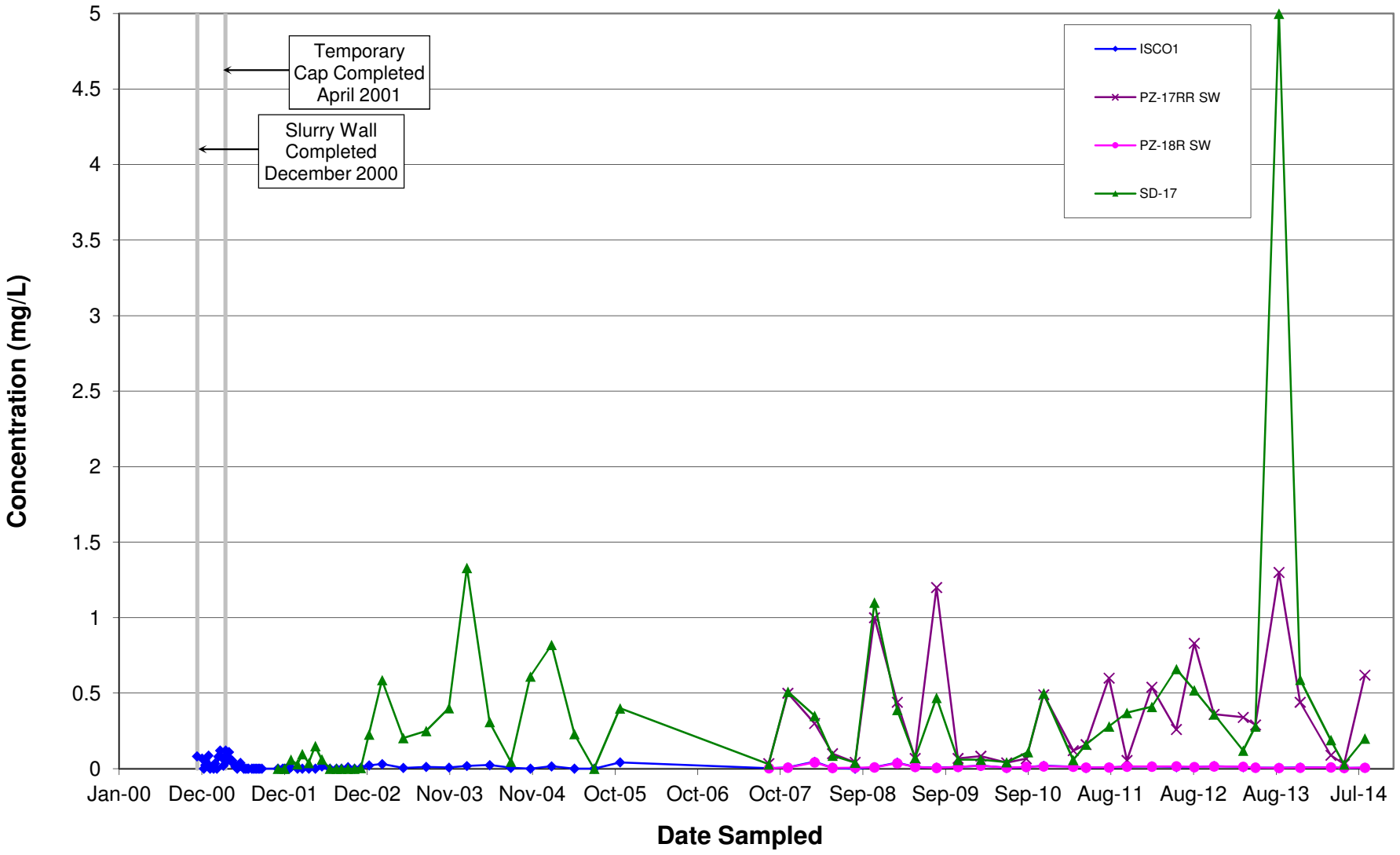
Semi-Annual Status Report No. 15
Olin Chemical Superfund Site
Wilmington, Massachusetts

Filtered Aluminum in Surface Water
in the Lower South Ditch

Figure D-2.2

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Aluminum SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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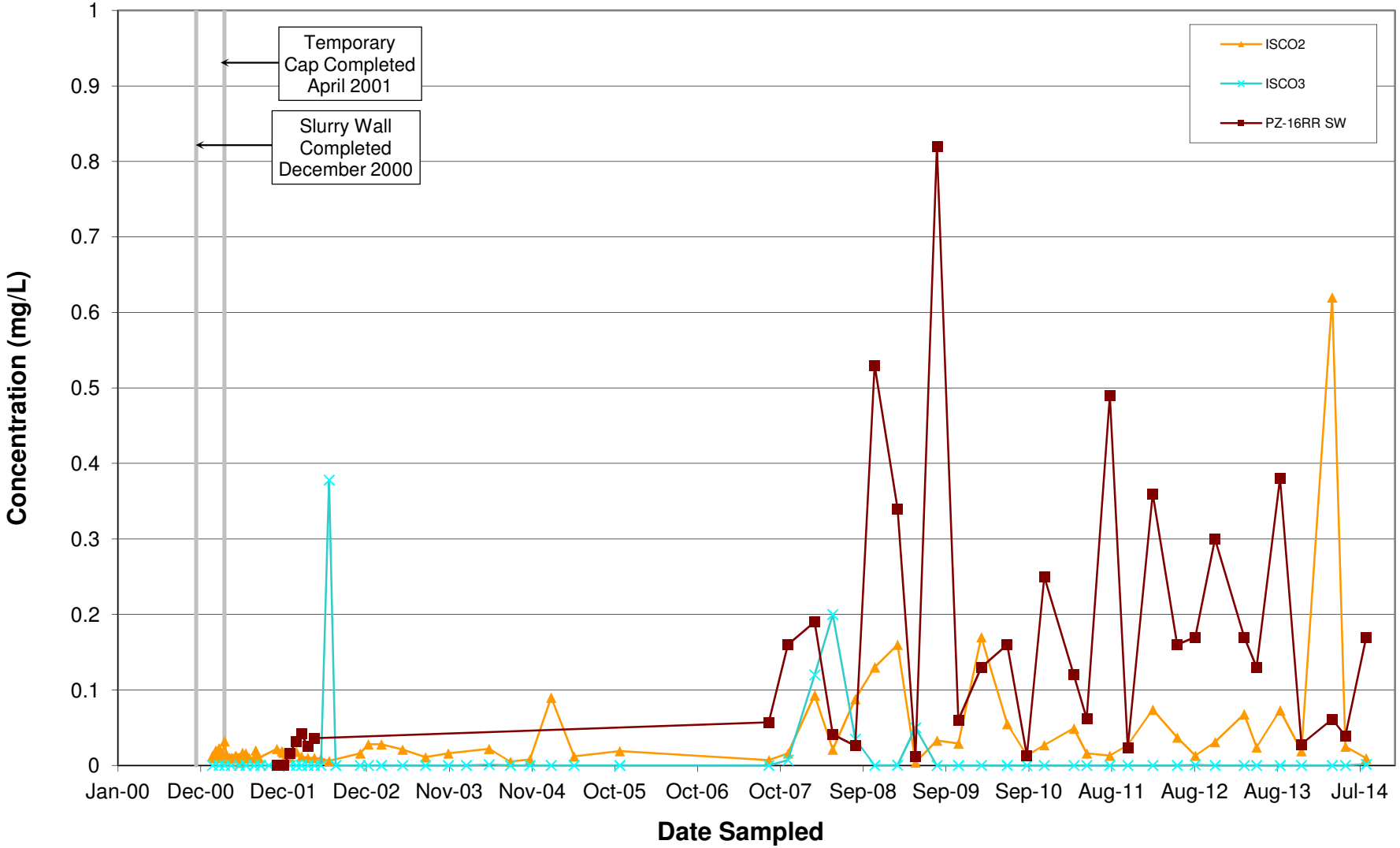
Filtered Chromium in Surface Water
in the Upper South Ditch

Figure D-2.3

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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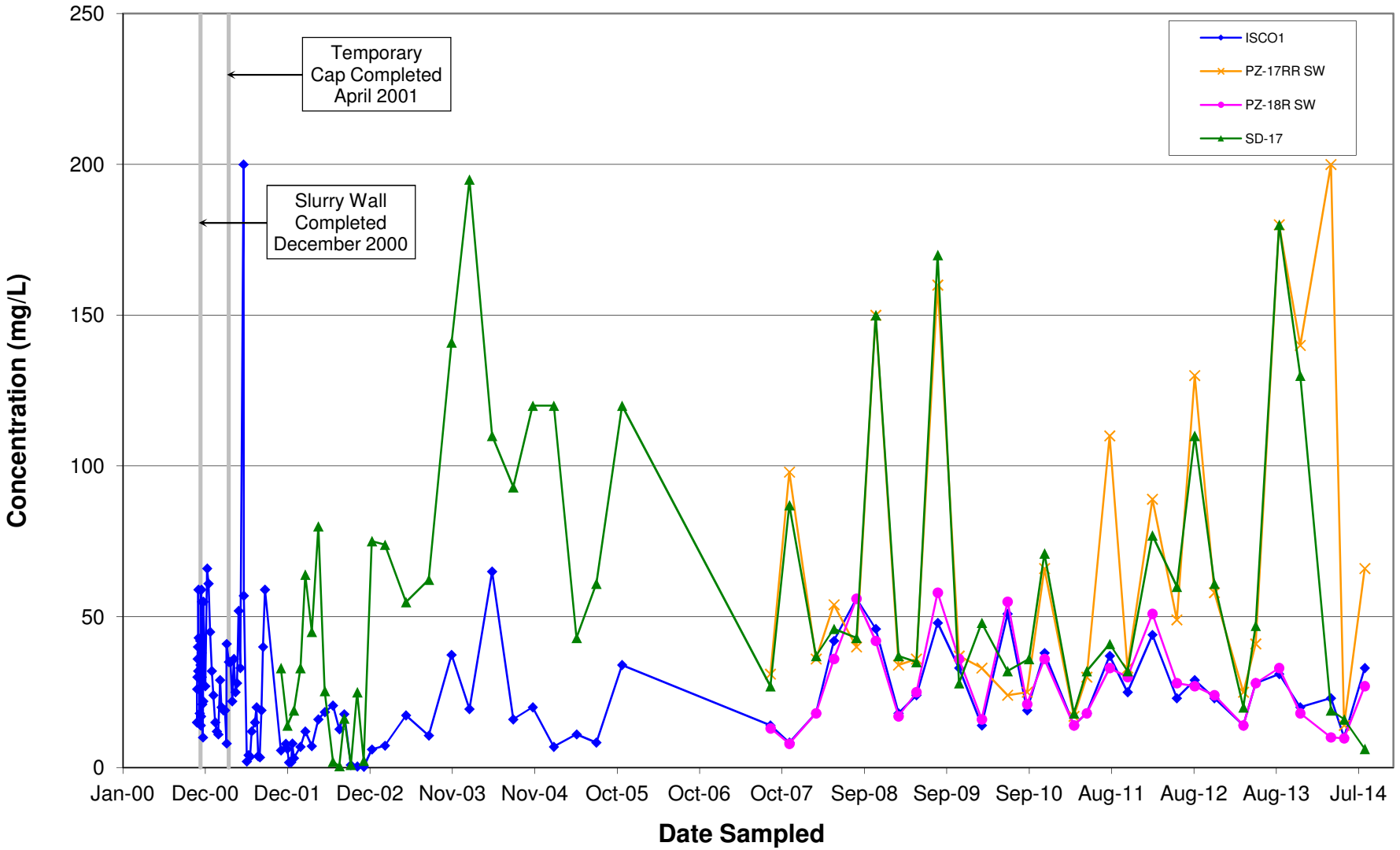
Filtered Chromium in Surface Water
in the Lower South Ditch

Figure D-2.4

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Dissolved Chromium SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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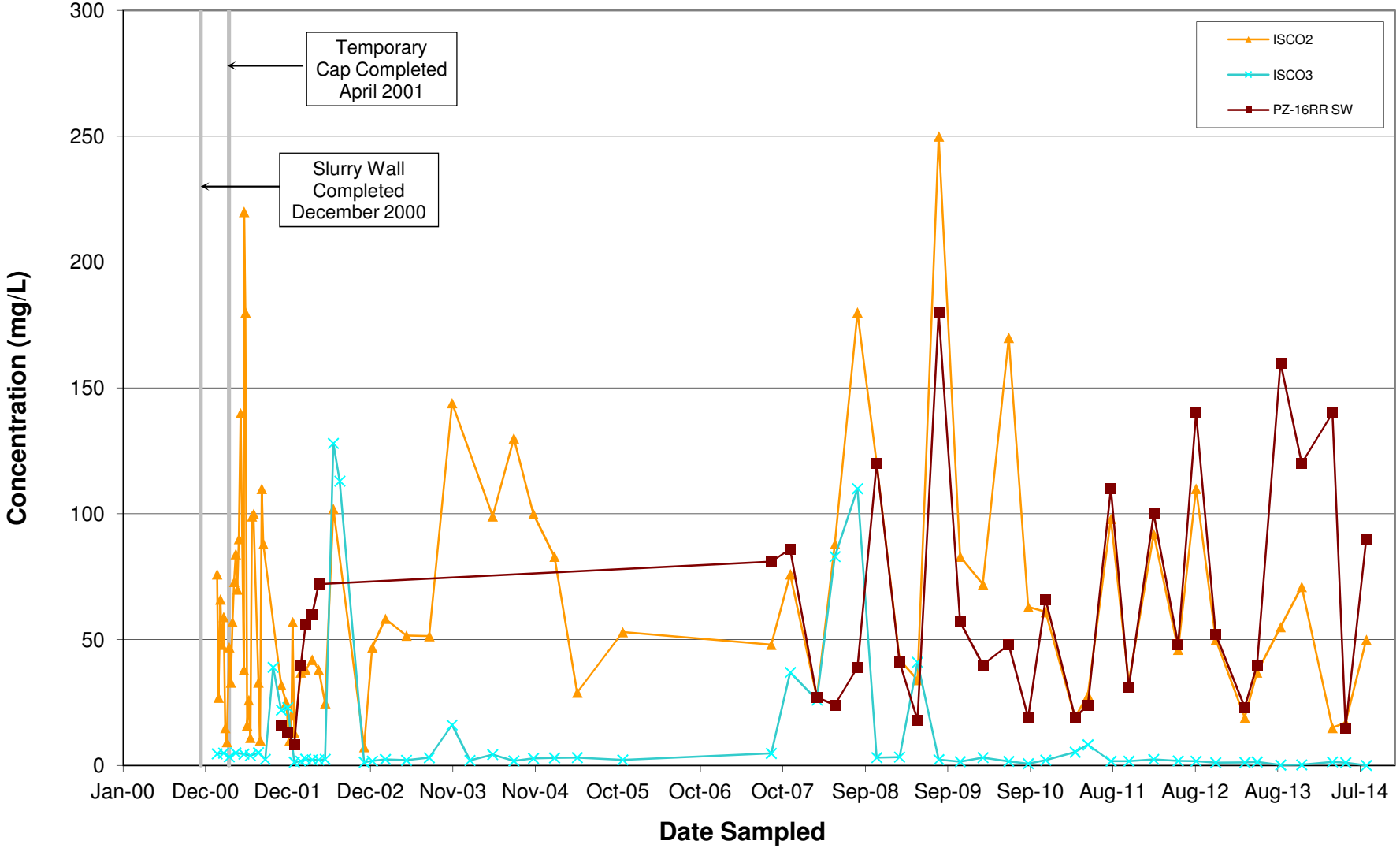
Ammonia in Surface Water
in the Upper South Ditch

Figure D-2.5

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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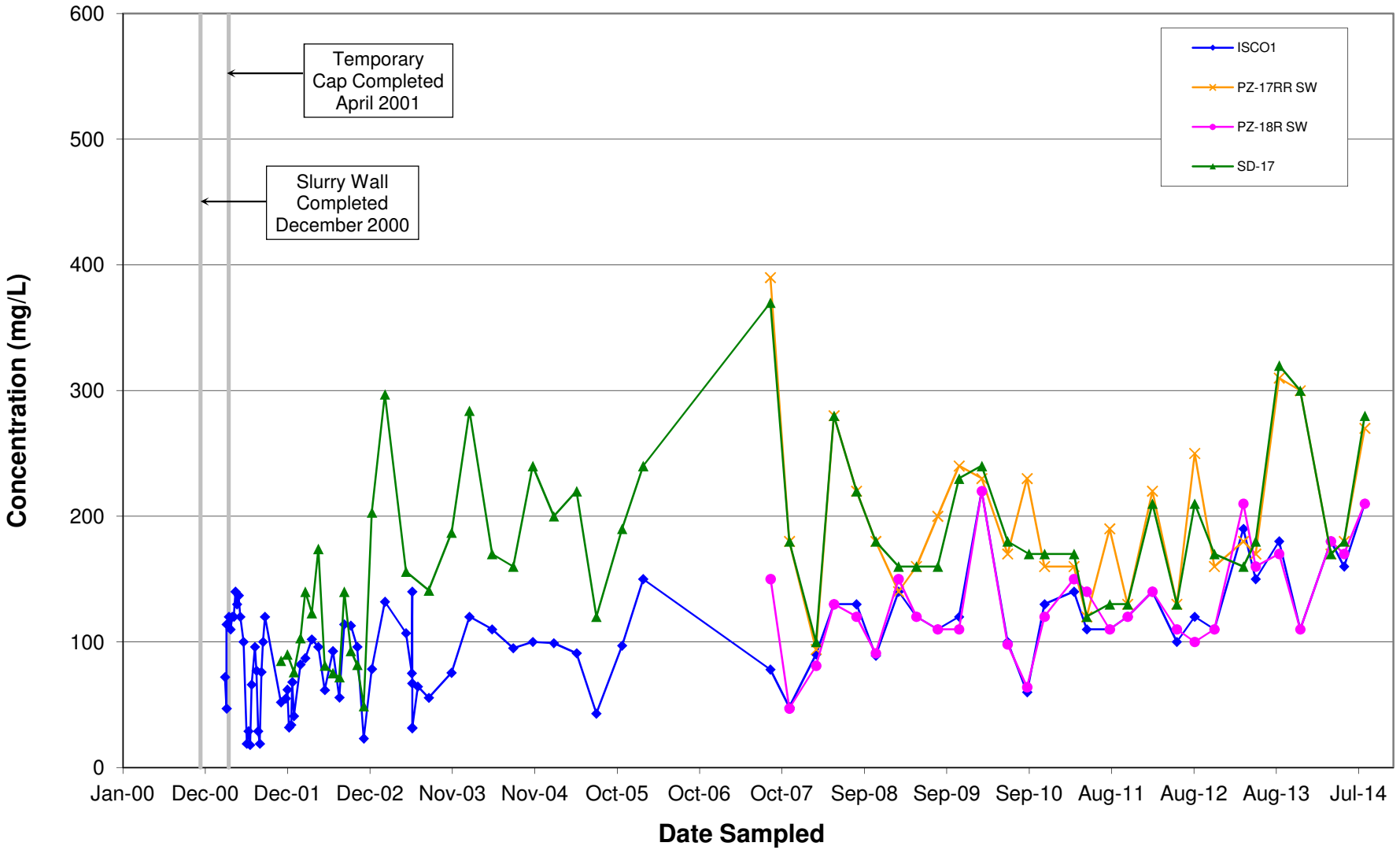
Ammonia in Surface Water
in the Lower South Ditch

Figure D-2.6

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Ammonia SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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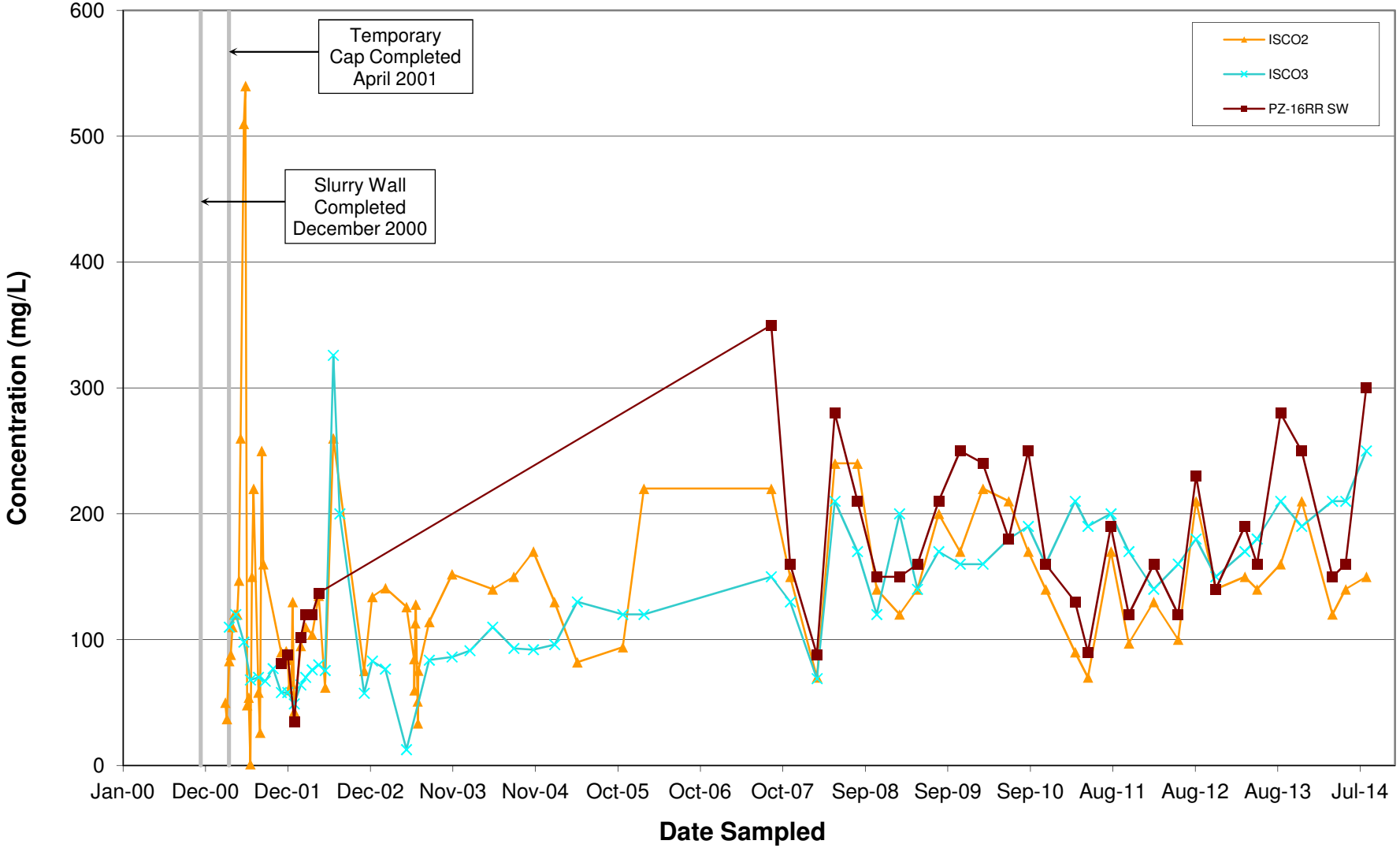
Chloride in Surface Water
in the Upper South Ditch

Figure D-2.7

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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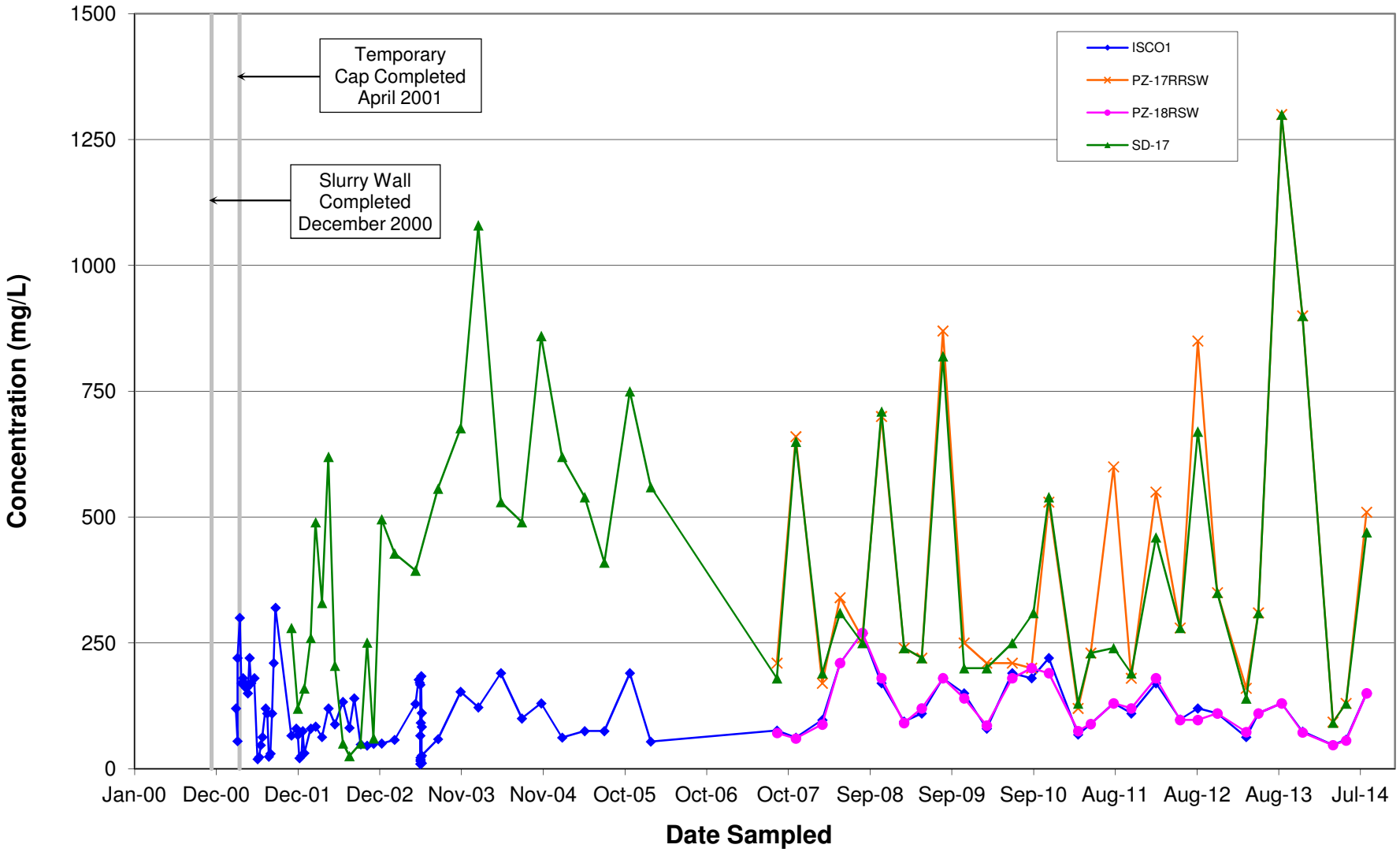
Chloride in Surface Water
in the Lower South Ditch

Figure D-2.8

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Chloride SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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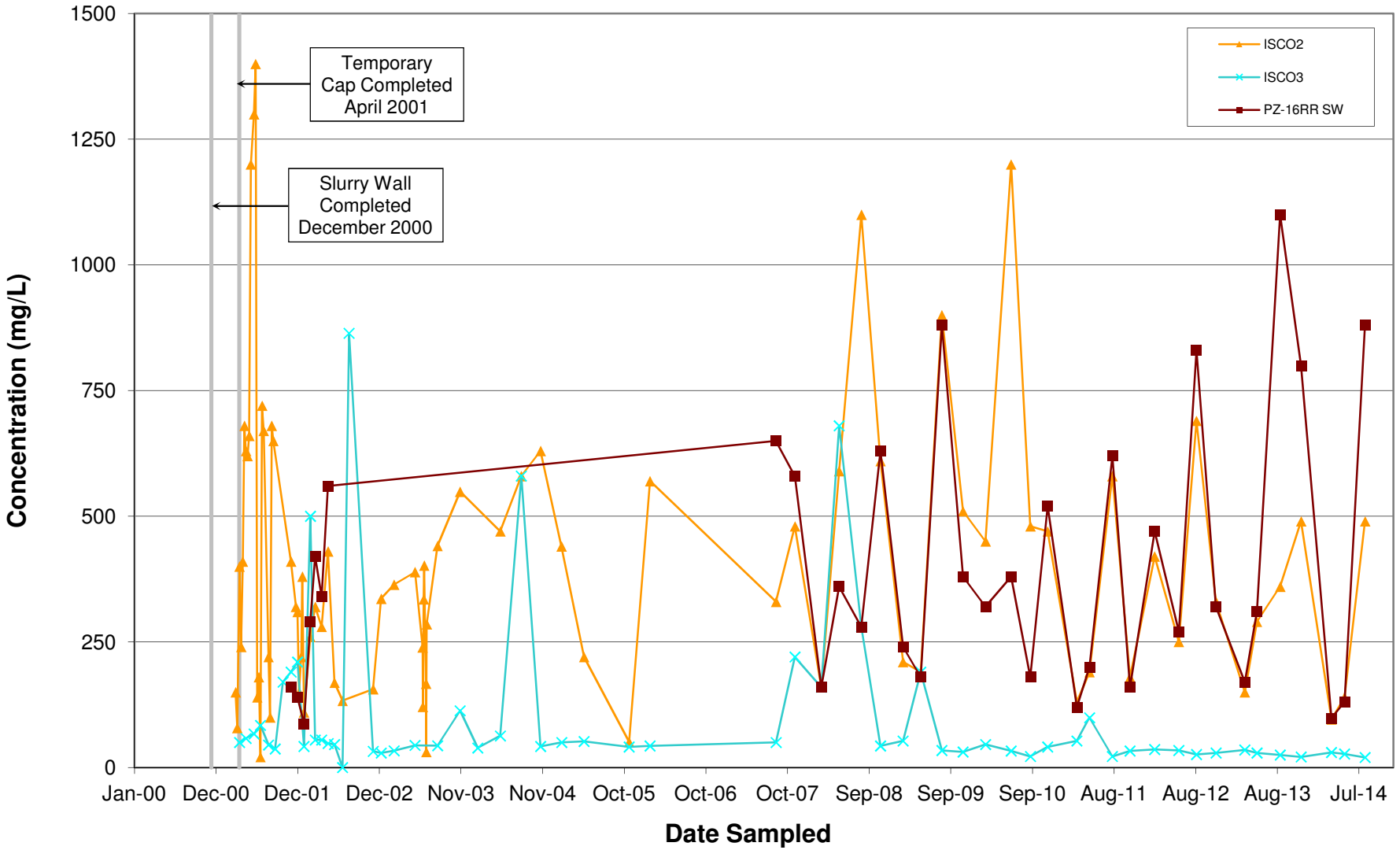
Sulfate in Surface Water
in the Upper South Ditch

Figure D-2.9

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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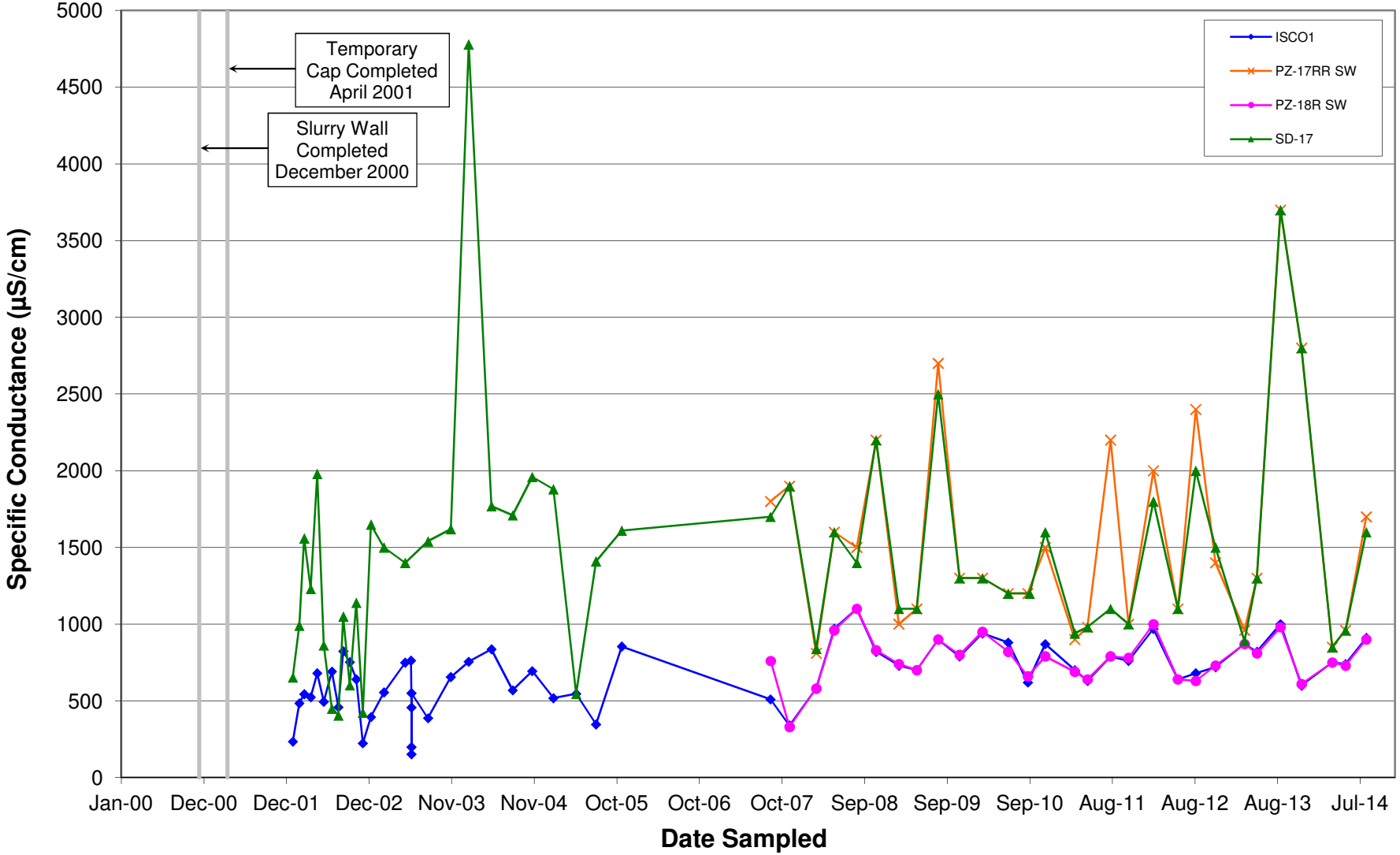
Sulfate in Surface Water
in the Lower South Ditch

Figure D-2.10

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Sulfate SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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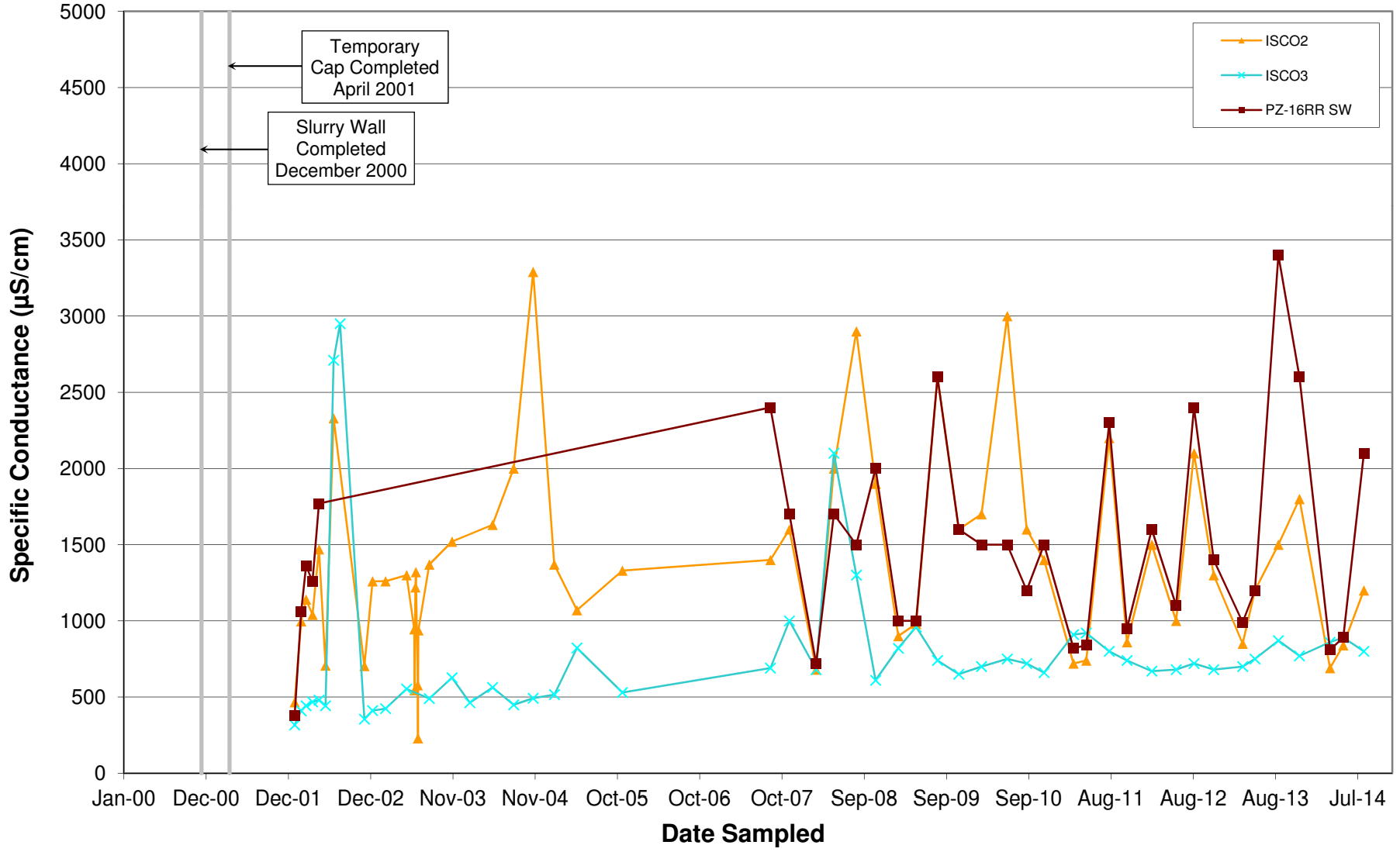
Specific Conductance in Surface Water
in the Upper South Ditch

Figure D-2.11

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance SW UpperSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014



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Specific Conductance in Surface Water
in the Lower South Ditch

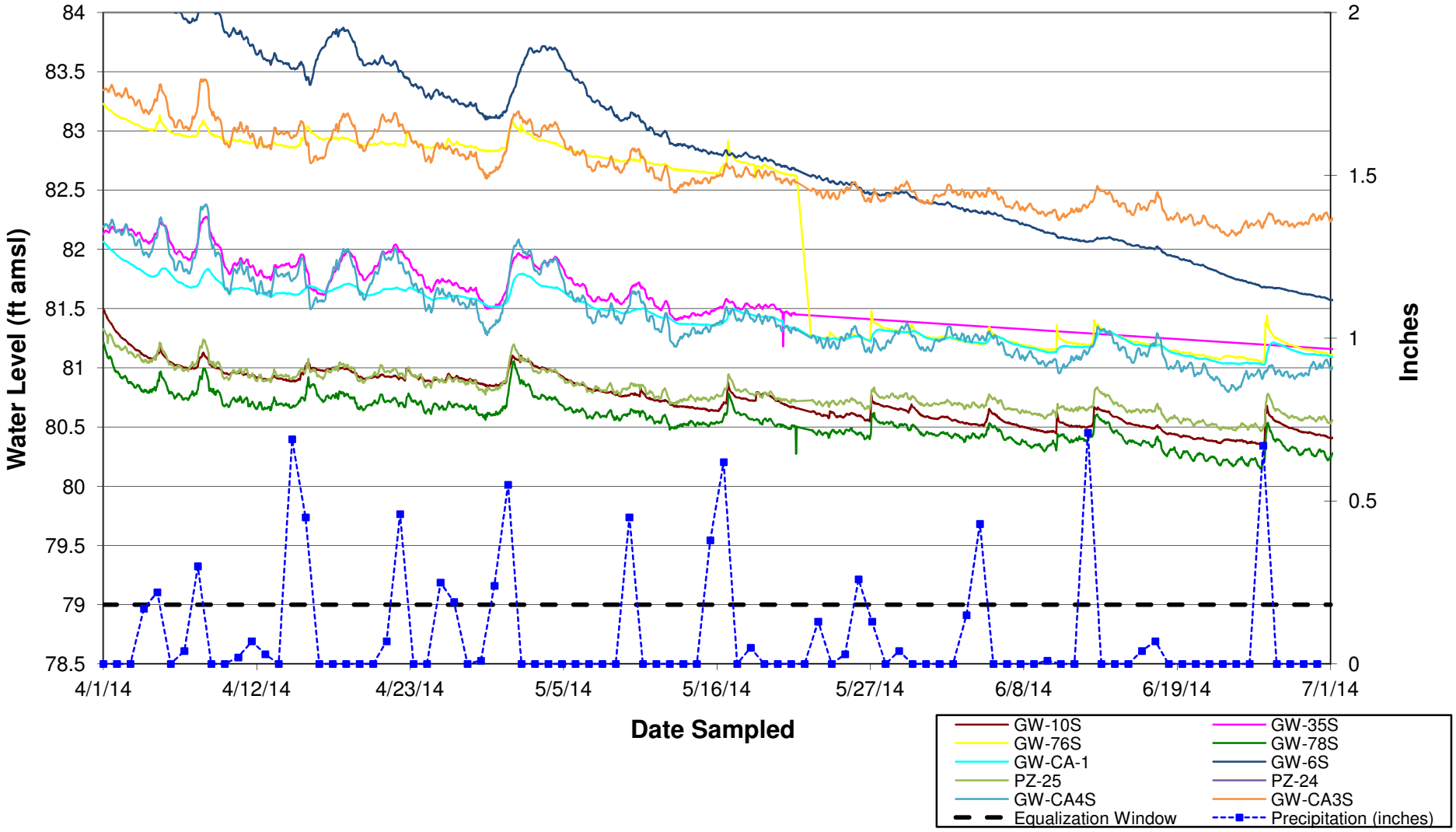
Figure D-2.12

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix D - Trend Graphs\
GW_SW Time Series Plots DAPL constituents.xls, Specific Conductance SW LowerSD

Prepared by: CTM 10/07/2014
Checked by: LCG 12/12/2014

APPENDIX E

Slurry Wall/Cap Data Logger Water Level Plots



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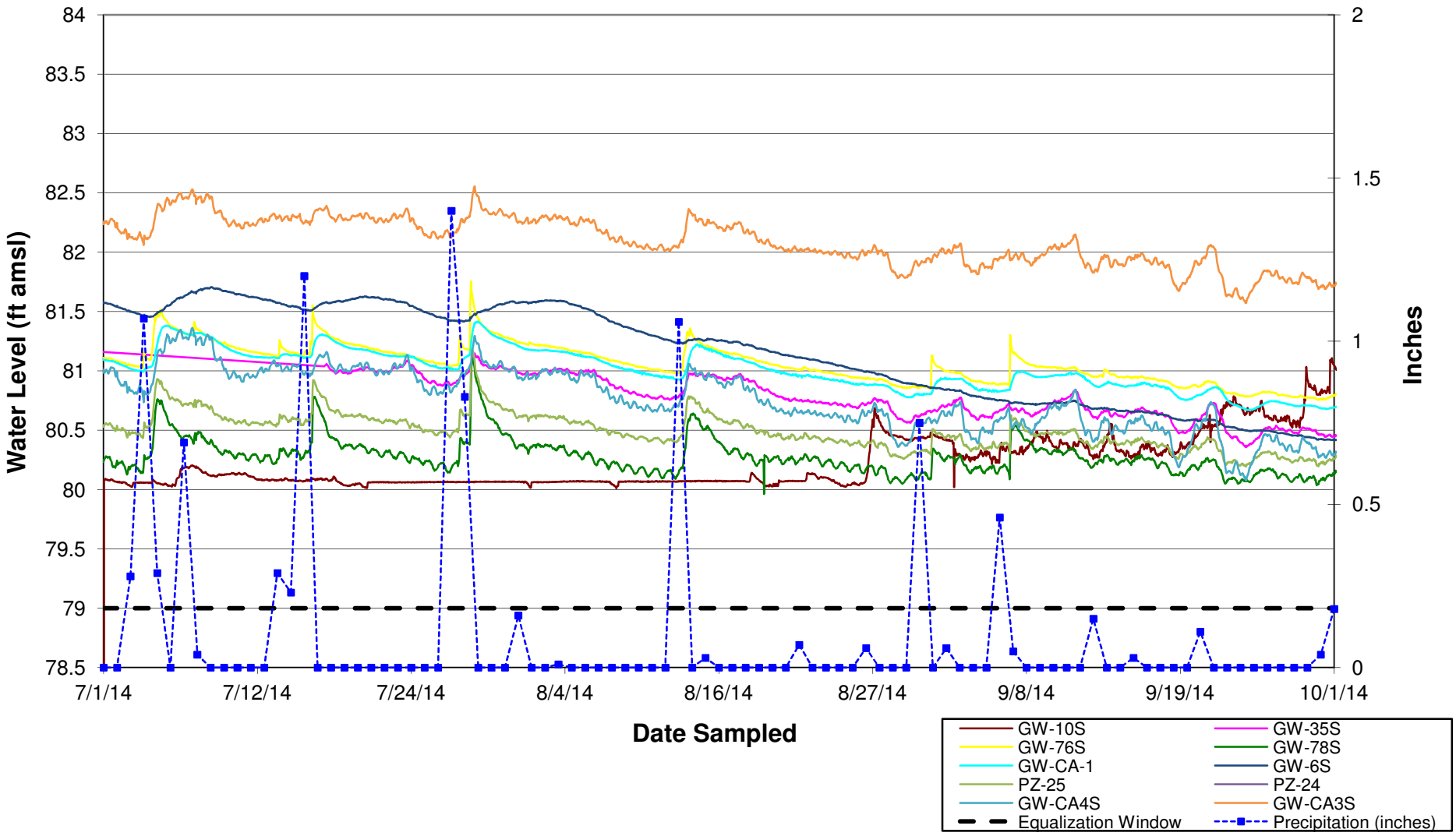
Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation - Second Quarter 2014
Figure E-1

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix E - Water Level Plots\
Data Logger Corrections.xls2nd Quarter Fig

Prepared by: BJR
Checked by: CTM



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Groundwater Elevation (Corrected for Barometric Pressure) and Precipitation - Third Quarter 2014

Figure E-2

\\WFD-FS1\projectf$\Projects\old_Wakefield_Data\projects\OLIN\Wilmington\SemiAnnual Status Report\2015 January\Appendix E - Water Level Plots\
Data Logger Corrections.xls3rd Quarter Fig

Prepared by: BJR
Checked by: CTM