FIRST FIVE-YEAR REVIEW REPORT FOR SUTTON BROOK DISPOSAL AREA SUPERFUND SITE TEWKSBURY, MASSACHUSETTS

Prepared by

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

ADAFs	Age Dependant Potency Adjustment Factors
ALM	Adult Lead Methodology
ARAR	Applicable or Relevant and Appropriate Requirement
BERA	Baseline Ecological Risk Assessment
BLL	Blood Lead Level
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
COCs	Contaminants of Concern
COPCs	Contaminants of Potential Concern
CSM	Conceptual Site Model
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESD	Explanation of Significant Differences
FDDA	Former Drum Disposal Area
FEMA	Federal Emergency Management Agency
FYR	Five-Year Review
GSA	Garage and Storage Area
HHRA	Human Health Risk Assessment
HI	Hazard Index
ICs	Institutional Controls
IEUBK	Integrated Exposure Uptake Biokinetic Model
LTM	Long-term Monitoring
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MMCL	Massachusetts Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NAUL	Notice of Activity and Use Limitation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effects Level
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
O&M	Operation and Maintenance
OLEM	Office of Land and Emergency Management
ORSG	MassDEP Office of Research and Standards Guidelines
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAHs	Polycyclic Aromatic Hydrocarbons
PCE	Tetrachloroethene
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFHpA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexanesulfonic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid or Perfluorooctane Sulfonate
PFNA	Perfluorononanoic Acid
PPRTV	Provisional Peer Reviewed Toxicity Value

PSDs	Performing Settling Defendants
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RfD	Reference Dose
ROD	Record of Decision
RPFs	Relative Potency Factors
SLERA	Screening-level Ecological Risk Assessment
SLs	Screening Levels
SPLP	Synthetic Precipitation Leaching Procedure
SSLs	Soil Screening Levels
SVOC	Semi-volatile Organic Compound
TBC	To be considereds
TCE	Trichloroethene
UCL	Upper Confidence Limit
UU/UE	Unlimited Use and Unrestricted Exposure
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the first FYR for the Sutton Brook Disposal Area Superfund Site. The triggering action for this statutory review is the on-site construction mobilization date (May 19, 2014). The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

There is one Operable Unit (OU) at this site. The major components of the remedy for the site include: excavation of contaminated soils and sediments above site specific cleanup levels (soils at the Garage and Storage Area [GSA] and the Former Drum Disposal Area [FDDA], and contaminated sediments from Sutton Brook between the landfill lobes); consolidation of excavated soils, sediments, and debris into the landfill; construction of a multi-layer impermeable cap over the landfill lobes; interception of groundwater from the southern lobe; a combination of collection and treatment and monitored natural attenuation (MNA) for contaminated groundwater; institutional controls; and long-term monitoring (LTM).

The Sutton Brook Disposal Area Superfund Site Five-Year Review was led by Don McElroy of EPA, Remedial Project Manager for the Sutton Brook Disposal Area site, with support from AECOM, contractor to EPA Region 1. The review began on 11/26/2018.

Site Background

The Sutton Brook Disposal Area, referred to during most of its history as the Rocco's Landfill or Tewksbury Town Dump, is located on approximately 100 acres of land off South Street on the eastern boundary of the Town of Tewksbury, Middlesex County, Massachusetts (see Figure 1 in Appendix F). A small portion of the landfill also extends into the Town of Wilmington. Two major source areas exist on the site: the Landfill Lobes, which include the Northern Lobe and Southern Lobe; and the FDDA. (see Figures 2 and E-2 in Appendix F). The Landfill Lobes comprise about 40 acres of the site. In 2000, between 300 and 400 buried drums were removed from the FDDA, which is located outside the southwest edge of the Northern Lobe. Sutton Brook (and associated wetlands) flows east to west through the property. Sutton Brook itself divides the landfill into the Northern and Southern lobes. Additional wetland areas are located south of the landfill and along the eastern and western portions of the property.

The majority of the site is unpaved and relatively flat, aside from the steeply-sloped landfill lobes. Outside the landfill lobes, the site primarily consists of wetlands including several individual wetland areas (a red maple swamp/floodplain associated with Sutton Brook [greater than 50 acres]; a small man-made pond [approximately 2 acres]; man-made areas subject to flooding [small forested wetland area and a borrow pit]; and an emergent wetland area).

The site is surrounded primarily by open space, farming operations, a composting operation, and residential dwellings. The area within one-half mile of the site is primarily used for residential, light commercial/industrial, and agricultural purposes with areas of protected open space present for recreational use.

Reasonably anticipated future uses of the site include passive recreational use of the wetland areas and

residential/commercial use of the upland areas, beyond the landfill lobes. Reasonably anticipated future uses of adjacent land in surrounding areas include recreational and residential/commercial use.

A more complete description of the site can be found in Section 1 of the Remedial Investigation Report (Woodard & Curran, 2007) and in the ROD (USEPA, 2007).

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Sutton Brook Disposal Area		
EPA ID: MAD980520696		
Region: 1	**State:** MA	**City/County:** Tewksbury/Middlesex
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA *[If "Other Federal Agency", enter Agency name]*:		
Author name (Federal or State Project Manager): Don McElroy		
Author affiliation: EPA Region 1		
Review period: 11/26/2018 - 5/19/2019		
Date of site inspection: 12/6/2018		
Type of review: Statutory		
Review number: 1		
Triggering action date: 5/19/2014		
Due date *(five years after triggering action date)*: 5/19/2019		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The sources of contamination, release mechanisms, exposure pathways to receptors for the site, as well as other site-specific factors, are diagrammed in a Conceptual Site Model (CSM), which is provided in Figure E-1 in Appendix F. The CSM is a three-dimensional "picture" of site conditions that illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors. It documents current and potential future site conditions and shows what is known about human and environmental exposure through contaminant release and migration to potential receptors. The risk assessment and response action for the site are based on this CSM.

The sources of contamination for the site are primarily the landfill waste, soils at the Former GSA, and buried drums at the FDDA.

The primary constituents detected in the groundwater samples near the Landfill Lobes were volatile organic compounds (VOCs), metals, semi-volatile organic compounds (SVOCs) and one pesticide. The highest concentrations of VOCs were detected in the wells located adjacent to the northwestern and northeastern sides of the Southern Lobe. The VOC generally detected at the highest concentration in the wells was toluene.

Similar constituents as detected in groundwater were also detected in surface water and sediment samples. The samples with the highest concentrations were detected in the stretch of Sutton Brook which traverses in between the two Landfill Lobes.

A removal action was conducted in the FDDA, initially performed by EPA in 2000 and completed by a group of PRPs in 2002, in which approximately 300 to 400 crushed drums were excavated and 13,786 tons of soils were transported off-site for disposal at an approved facility. Post-excavation data indicated that residual levels of VOCs (benzene, trichloroethene [TCE], toluene, tetrachloroethene [PCE], ethylbenzene, trimethylbenzenes, and xylenes) and SVOCs (bis(2-ethylhexyl)phthalate, di-noctylphthalate, and naphthalene) are present in soils. The highest concentrations of VOCs and SVOCs were detected at or just above the water table surface (4 to 6 feet below current grade) and decrease with depth. The highest total VOC and SVOC concentrations were detected in samples located on the southeast portion of the FDDA. Approximately 9,000 cubic yards of residually-impacted soils are estimated to remain in this area.

The primary migration pathways for these residual contaminants are infiltration/leaching into the subsurface with subsequent transport via groundwater flow. In addition, soil erosion and volatile air emissions are potential migration pathways for contaminants that may be exposed or migrate to the surface. However, the highest concentrations of contaminants are not located at the ground surface.

VOCs were also the primary constituents detected in the groundwater samples at the FDDA with benzene, toluene, ethylbenzene, and xylenes (BTEX) and lower concentrations of 1,1,1-trichloroethane, TCE, and 1,1-dichloroethane being detected at the greatest frequency. Elevated concentrations of 4-methyl-2-pentanone, 2-butanone, and phenols were also detected in groundwater proximate to the FDDA.

These data indicate that there are two primary contaminant plumes in groundwater beneath the site. The sources of these plumes are the FDDA and the Southern Lobe (the Northern Lobe contributes a relatively small amount of groundwater contamination when compared with the FDDA and the Southern Lobe). As contaminants within these plumes migrate away from the source areas, the plumes discharge into the wetland area and Sutton Brook. The results of the surface water and sediment sampling within the brook and wetland areas correlate well with groundwater contamination and groundwater plume discharge areas.

As presented in the 2007 Record of Decision (ROD), the baseline human health and ecological risk assessments revealed that:

- a future resident potentially exposed to compounds of concern in soils via ingestion and dermal contact may present an unacceptable human health risk (exceedance of 10^{-4} cancer risk);
- a future resident or facility worker potentially exposed to compounds of concern in groundwater via inhalation may present an unacceptable human health risk (Hazard Index [HI] of concern);
- a future resident or facility worker potentially exposed to compounds of concern in groundwater via ingestion may present an unacceptable human health risk(exceedance of 10^{-4} cancer risk and HI of concern); and
- unacceptable ecological risk exists to terrestrial plants and wildlife in Upland Soil, aquatic invertebrates in Upper Sutton Brook sediments and aquatic life in Upper Sutton Brook surface water.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in the 2007 ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Response Actions

The Remedial Action Objectives (RAOs) which were utilized to develop remedial alternatives are:

- Prevent direct contact/ingestion of landfill contents for the protection of human and ecological receptors;
- Prevent direct contact and ingestion of residual levels of SVOCs and VOCs in soils in the FDDA and metals and SVOCs in soils in the GSA above applicable human health or ecological based criteria;
- Prevent direct exposure to impacted surface water and sediments in those areas of the wetlands and brook determined by the ecological risk assessment;
- Prevent contaminant migration via surface run-off and erosion through the "source areas" to surface water or sediments in the brook or wetlands for the protection of ecological receptors;
- Control landfill gas;
- For the protection of potential human receptors, reduce contaminant leaching via infiltration through the "source areas" with subsequent migration to groundwater at concentrations in excess of State or Federal Maximum Contaminant Levels (MMCLs or MCLs) and applicable groundwater quality standards. For contaminants where no State or Federal drinking water standard has been established, reduce leaching such that groundwater concentrations will not exceed human health risk-based levels (i.e., greater than the carcinogenic target risk range of 10^{-4} to 10^{-6} or non-carcinogenic target organ Hazard Index of 1);
- For the protection of potential human receptors, prevent exposure to groundwater impacted by site contaminants at concentrations that exceed State or Federal drinking water standards (MMCLs or MCLs). For contaminants where no State or Federal drinking water standard has been established, prevent exposure to concentrations which exceed human health risk-based levels (i.e., greater than the carcinogenic target risk range of 10^{-4} to 10^{-6} or non-carcinogenic target organ Hazard Index of 1). For contaminants that are a concern with respect to vapor intrusion, prevent exposure to indoor air concentrations that are not protective of human health;
- Limit the discharge of impacted groundwater to Sutton Brook to prevent site contaminants in surface water or sediments from exceeding ecological based criteria or unacceptable levels of risk to ecological receptors;
- Prevent migration of contaminants off-site via groundwater or surface water at levels in excess of Federal and/or State standards/criteria or unacceptable levels of risk to human or ecological receptors.

More specifically, the remedy seeks:

- To reduce the potential exposure of a future resident to carcinogenic polycyclic aromatic hydrocarbons (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) in upland soils via direct contact that may present a human health risk in excess of 10^{-4} cancer risk such that the cancer risk attributable to this medium is within the range of $10^{-4}$to 10^{-6} and complies with Applicable or Relevant and Appropriate Requirements (ARARs);
- To reduce the potential exposure of a future resident to toluene and xylenes in groundwater via inhalation that may present a human health risk in excess of HI>1 such that the non-cancer risk attributable to this medium is a HI which does not exceed one and complies with ARARs;
- To reduce the potential exposure of a future resident to acrylonitrile, benzene, carbon tetrachloride, ethyl methacrylate, ethylbenzene, methylene chloride, xylenes, 1,2-dichloroethane, 1,4-dioxane, 4-methyl-2-pentanone, bis(2-ethylhexyl)phthalate, naphthalene, tetrachloroethene, tetrahydrofuran, toluene, trichloroethene, vinyl chloride, methylphenols, N-nitrosodi-n-butylamine, N-nitrosopyrrolidine, antimony, arsenic, beryllium, cadmium, and manganese and zinc in groundwater via ingestion that may

present a human health risk in excess of 10^{-4} cancer risk, or a HI>1 such that the cancer and non-cancer risk attributable to this medium are within the range of 10^{-4} to 10^{-6} and a HI which does not exceed one and complies with ARARs;

- To reduce the potential exposure of a future facility worker to 1,4-dioxane, 4-methyl-2-pentanone, acrylonitrile, vinyl chloride, and arsenic in groundwater via ingestion that may present a human health risk in excess of 10^{-4} cancer risk or HI>1 such that the cancer and noncancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and a HI which does not exceed one and complies with ARARs;
- To reduce the potential exposure of a future facility worker to xylenes in groundwater via inhalation that may present a human health risk in excess of HI>1 such that the non-cancer risk attributable to this medium is a HI which does not exceed one and complies with ARARs;
- To reduce the potential exposure of aquatic invertebrates to 1,3,5-trimethylbenzene, ethylbenzene, and xylenes, among others in sediments directly between the landfill lobes that may present an ecological risk in excess of No Observed Adverse Effects Level (NOAEL) benchmarks such that the ecological risk attributable to this medium complies with ARARs;
- To reduce the potential exposure of aquatic life (e.g., fish, amphibians, invertebrates) to 4,4'-DDT, ethylbenzene, toluene, and xylenes in surface water directly between the landfill lobes that may present an ecological risk in excess of effects-based, NOAEL surface water benchmarks or water quality standards such that the ecological risk attributable to this medium complies with ARARs;
- To reduce the potential exposure of terrestrial plants to bis(2-ethylhexyl)phthalate, ethylbenzene, naphthalene, and xylenes; soil invertebrates from 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, toluene, and xylenes; and terrestrial wildlife (American robin) based on food chain model dietary exposure to 1,2,4-trimethylbenzene, bis(2-ethylhexyl)phthalate, di-n-octylphthalate, and xylenes in soils at the FDDA such that the ecological risk attributable to this medium complies with ARARs; and
- To reduce the potential exposure of American robin based on food chain dietary exposure to di-n-octylphthalate and lead; and soil invertebrates from exposure to zinc in upland soils (excluding FDDA) such that the ecological risk attributable to this medium complies with ARARs.

On September 27, 2007 EPA issued a ROD choosing the remedy for Sutton Brook Disposal Area which involves the treatment of contaminated groundwater, the containment of groundwater, the excavation and containment of contaminated soils and sediments, and the containment of landfill waste, to prevent risks to potential future residents and facility workers and to protect terrestrial and aquatic wildlife. The remedy also requires institutional controls to prevent exposure to contaminated media prior to cleanup levels being achieved as well as to protect constructed components of the remedy. The selected remedy is a comprehensive approach for this site that addresses all current and potential future risks caused by soil, groundwater, surface water and sediment contamination. Specifically, this remedial action addresses contaminated soils in the GSA and the FDDA, contaminated groundwater throughout the site outside of the landfill lobes, and surface water and sediments in Sutton Brook directly between the landfill lobes.

The major components of this remedy are:

- Excavation of contaminated soils and sediments above site specific cleanup levels (soils at the GSA and the FDDA, and contaminated sediments from Sutton Brook between the landfill lobes);
- Consolidation of excavated soils, sediments, and debris into the landfill;
- Construction of a multi-layer impermeable cap over the landfill lobes;
- Interception of groundwater from the southern lobe;
- A combination of collection and treatment and monitored natural attenuation for contaminated groundwater;
- Institutional controls; and
- Long-term monitoring.

Cleanup levels for groundwater, soil, surface water, and sediment originally presented in the 2007 ROD are included in Tables L-1 through L-5 in Appendix C. Based on the presumptiveness of the site actions, original cleanup levels for the FDDA soils and Sutton Brook surface water and sediment were based on limited evaluations. Additional review/evaluation was performed during the design (Geosyntec, 2013) which resulted in development of revised performance standards for these areas. These changes have been included in Appendix C.

Status of Implementation

On November 9, 2010, the U.S. District Court for the District of Massachusetts entered a Consent Decree, in which the Sutton Brook Performing Settling Defendants (PSDs) agreed to implement the remedy selected in the 2007 ROD. As noted above, additional review/evaluation was performed during the preparation of the design which resulted in development of revised performance standards for the FDDA soils and Sutton Brook surface water and sediment. During the design, it was determined that groundwater could be discharged to the local sanitary sewer system and ulitimately to a wastewater treatment facility. Based on discharge limits allowed by the Lowell Regional Wastewater Utility (Permit No. 012, signed July 23, 2015 and expiring July 23, 2020), treatment of groundwater prior to sewer discharge was determined to be unnecessary. The Remedial Design was approved by EPA in June 2013. On-site mobilization for construction of the remedy began on May 19, 2014. A brief summary of the construction dates for the primary components of the remedial action is presented below:

- Pre-Construction Meeting on 28 May 2014
- Vertical Barrier: 21 July 2014 - 4 September 2014
- Extraction System: 16 June 2014 – 25 November 2014
- FDDA (excavation/backfill): 23 September 2014 – 23 October 2015
- GSA-1 through GSA-5 (excavation/backfill): 19 June 2014 – 15 December 2015
- Debris Piles (excavation/backfill): 25 June 2014 – 25 November 2015
- Southern Lobe Cap (geosynthetics, Protective Cover, and Topsoil): 29 October 2014 – 6 May 2015
- Northern Lobe Cap (geosynthetics, Protective Cover, and Topsoil): 11 May 2015 – 11 December 2015
- Excavation of Brook Sediment: 7 July 2015 – 31 July 2015

The PSDs submitted a final construction report in September 2016 (Geosyntec, 2016a), documenting the construction activities and demonstrating compliance with the requirements of the project. This report was reviewed and approved by EPA, certifying completion of construction. Institutional Controls (ICs) still have not been established for the site, although access is restricted by the PSDs and Operation and Maintenance (O&M) activities note whether trespassing or other disturbance of the remedy has occurred.

Submission of annual MNA evaluation reports began in 2017. At this time, it does not appear that there has been a sufficient amount of data collected to show that groundwater cleanup standards can or cannot be achieved within a reasonable time period.

IC Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater and engineered controls (e.g., the landfill cap and associated features, as well as the groundwater collection system)	Yes	Yes	Being developed (landfill parcels and adjacent properties)	Protect landfill cap and associated features, including groundwater collection equipment. Prevent use of groundwater under the landfill lobes. Establish temporary ICs beyond the compliance boundary until groundwater cleanup standards are achieved	Notice of Activity and Use Limitation (NAUL) planned

Systems Operations/Operation & Maintenance

The Operation and Maintenance phase of the project began in the first quarter of 2017 (final plan approved in December 2016; Geosyntec, 2016b). This phase entailed inspection and maintenance of the landfill cap and associated features of the remedy, as well as monitoring of groundwater (quarterly for the first five years, with a comprehensive annual round), surface water (annually), and sediment (every five years). The PSDs are performing the required O&M activities.

O&M activities have generally been performed as expected in the O&M plan. The groundwater extraction system generally operates continuously with minor shutdown periods due to maintenance or infrequent loss of power to the area. Some monitoring locations have been impacted by beaver activity at the site which inundated a large area of the site with surface water. This resulted in limited access to some monitoring locations at times. The PSDs have been proactive in engaging appropriate parties to breach the beaver dams and relocate beavers.

As noted earlier, groundwater is discharged to the sanitary sewer system via a permit which includes discharge limits. The arsenic discharge limit was modified in 2017 to a loading limit as opposed to a concentration. This requires management of flow, depending on the groundwater concentrations. Based on typical groundwater concentrations, the system operates utilizing 30,000 gallons as a daily maximum flow to limit the arsenic loading discharging from the site. While rare, the system has in some instances been shut down for short periods of time at the end of a day if that maximum total flow was reached. In a recent O&M report (GES, 2019), the average flow rate and average daily flow volume for that quarter were 6.46 gpm and 9,308 gpd, respectively. Discharge monitoring results show continued compliance with permit limits (GES, 2018).

III. PROGRESS SINCE THE LAST REVIEW

This is the first five-year review for the Sutton Brook Disposal Area Superfund Site. Therefore, there are no previous protectiveness determinations/statements, nor issues/recommendations.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. Interviews were performed in March and April 2019 with a representative for the PSDs, officials from Tewksbury, Massachusetts, and Massachusetts Department of Environmental Protection (MassDEP). Results of these interviews are summarized in Appendix E.

A public notice was made available by an EPA press release titled "EPA begins 14 reviews of Massachusetts Superfund site cleanups this year" which included the announcement that EPA was beginning a five-year review on the Sutton Brook Disposal Area during the Current Fiscal Year, on 2/21/2019, and an invitation to the public to submit any comments to the U.S. EPA. The results of the review and the report will be made available at the site information repository located at the Tewksbury Public Library located at 300 Chandler Street, Tewksbury, MA and on EPA's website at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100686.

Data Review

GSA Soil:
Appendix D contains soil analytical results for confirmatory samples collected during the remedial action in the GSA, including figures presenting locations sampled. As discussed in the Construction Completion Report (Geosyntec, 2016a), confirmatory samples were collected from the excavation floor and each sidewall. Two out of the five excavation areas were expanded due to cleanup level exceedances. Areas GSA-1, -2, -4, and -5 were originally 1 foot deep and GSA-3 was 2.5 feet deep. GSA-5 was later excavated down to the seasonal low water table elevation. With regard to protectiveness (see Question B below), the maximum detections of these soil samples (above the seasonal low water table elevation) are appropriate for use in human health evaluations related to soil remaining in the GSA. The maximum detections of the sidewall samples for each area, as well as the bottom samples from areas GSA-1, -2, and -4, are appropriate for use in ecological evaluations as representative of surface soil remaining in the GSA. A table summarizing these maximums has been included in Appendix D.

FDDA Soil:
Appendix D contains soil analytical results for confirmatory samples collected during the remedial action in the FDDA, including a figure presenting locations sampled. As discussed in the Construction Completion Report (Geosyntec, 2016a), confirmatory samples were collected from the excavation floor (all samples below the seasonal low water table elevation) and each sidewall (one at a depth of 0 to 6 inches from the surface and one from 6 inches above the floor of the excavation. With regard to protectiveness (see Question B below), the maximum detections of these soil samples (above the seasonal low water table elevation) are appropriate for use in human health evaluations related to leaching from soil to groundwater for soil remaining in this area. The maximum detections of the upper sidewall samples are appropriate for use in ecological evaluations as representative of surface soil remaining in this area. A table summarizing these maximums has been included in Appendix D.

Upper Sutton Brook Sediment:
Appendix D contains sediment analytical results for confirmatory samples collected during the remedial action in Upper Sutton Brook, including a figure presenting locations sampled. As discussed in the Construction Completion Report (Geosyntec, 2016a), record/confirmatory samples were collected from the excavation floor (record samples collected 24 inches below the water-sediment interface and backfilled following sample collection) and within 10 feet upstream and downstream of the excavation area (confirmatory samples collected in the 0 to 6 inch interval). With regard to protectiveness (see Question B below), the maximum detections of the shallow confirmatory sediment samples may no longer be appropriate for use in ecological evaluations based on their age. Two samples were recently collected (October 2018) from this area (see Appendix D). There were no

detections for analytes which have revised performance standards. However, the reporting limit of two analytes (2-methylphenol and 3/4-methylphenol) was above the performance standard. Two analytes were detected (1,4-dichlorobenzene and tetrahydrofuran) were detected, but do not have performance standards. A table summarizing these maximums has been included in Appendix D.

Sutton Brook Surface Water:
Appendix D contains surface water analytical results for samples collected from 2011 to 2018, including a figure presenting locations sampled. A table summarizing detections over time has been included in the appendix. As can be observed from the data presented, concentrations of analytes detected in surface water have declined over time to where there were no detections in October 2018.

Groundwater:
Appendix D contains groundwater analytical results for samples collected from 2011 to 2018, including a figure presenting locations sampled. Quarterly monitoring continues to be performed (results presented in quarterly monitoring reports) which include water level data and show that groundwater capture in the area of the extraction well appears to be performing as expected. Natural attenuation evaluation reports are to be submitted annually. Two have been submitted (2017 and 2018) to date. Based on the two reports submitted, it appears to be too early to determine if the groundwater remedy will achieve cleanup levels in the anticipated timeframe identified in the ROD (65-210 years).

Site Inspection

The inspection of the site was conducted on 12/6/2018. In attendance were Don McElroy of EPA, Remedial Project Manager for the Sutton Brook Disposal Area site, with support from AECOM, contractor to EPA Region 1. The purpose of the inspection was to assess the protectiveness of the remedy.

Remedial activities (summarized earlier) were completed in 2015. Photos of the Sutton Brook Disposal Area are included in Appendix B.1. During the inspection, the landfill cover, security fence, and operational systems appeared to be functioning properly and are well-maintained. No evidence of trespassing was observed at the time of the site walkover. There was vegetative growth in some downchutes and swales which should be reduced further (the most recent O&M report [4th Quarter 2018; GES, 2019] notes that this will be managed in spring 2019). The Site Inspection Checklist is included in Appendix B.2.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes. The review of documents, ARARs, risk assumptions, and the results of site inspections indicate that the landfill capping component of the remedy has been designed and constructed as intended in the ROD. The vertical barrier and groundwater extraction components of the remedy also were designed and constructed as intended in the ROD and appear to be operating as intended. Institutional Controls, as required under the ROD, have not been established yet, and the MNA portion of the remedy is still under evaluation.

Quarterly O&M reports show that the O&M is working in a manner that will continue to maintain the effectiveness of the remedy.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

Wetlands mitigation performance standards were achieved as documented in the Wetland Mitigation Monitoring Report, November 2018 (CEI, 2018). Future wetland monitoring will be required per the O&M plan (Geosyntec, 2016b) as part of future five-year reviews.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

No. There have been changes in exposure assumptions, risk assessment methodologies, and toxicity values since the ROD was issued, however the RAOs selected for the site are still valid. Additionally, new information has become available on emerging contaminants including 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS). The changes as described below do not affect the protectiveness of the remedy because current and future exposures are being prevented by the engineered controls, and will be strengthened by the planned institutional controls restricting groundwater extractions for potable use and prohibiting activities that could jeapordize the integrity of the landfill cap.

Changes in Standards and TBCs

A review of ARARs was performed to check the impact on the remedy protectiveness due to any changes in standards that were identified in the ROD, new promulgated standards, and/or changes in TBCs (to be considered).

Some requirements identified as potential ARAR in the ROD are no longer considered ARAR because the active groundwater remedy, as implemented, does not include any treatment (ex. air stripping, tank systems, etc.) and extracted groundwater is not discharged to surface water or injected underground. It is noted that 313 CMR 3.03 (Massachusetts Well Decommissioning Requirements) no longer exists, and the current citation is 310 CMR 46.00 (Certification of Well Drillers and Filling of Well Completion Reports). The requirements of 310 CMR 46.00 would be applicable to any future well abandonment or new well completion and include submittal requirements to MassDEP. Also, 40 CFR Part 6, Appendix A no longer exists and the current provision for floodplain management and protection of wetlands is a Federal Emergency Management Agency (FEMA) regulation codified at 44 CFR 9. None of these regulatory changes impact the protectiveness of the remedy.

Groundwater cleanup levels were established in the ROD for contaminants of concern (COCs) based on federal MCLs, EPA Drinking Water Health Advisories, or human-health risk based goals. Federal MCLs have not changed since the ROD for groundwater COCs and no changes have occurred to Lifetime Health Advisories for groundwater COCs that would affect the cleanup levels. For 1,4-dichlorobenzene, it is noted that the federal MCL (75 µg/L) was selected as the ROD cleanup level instead of the more stringent Massachusetts MCL (MMCL) of 5 µg/L, which was promulgated at the time of the ROD. As MMCLs are considered Relevant and Appropriate for site groundwater, it is recommended that the MMCL of 5 µg/L be established as the cleanup level in a decision document and used for future groundwater monitoring to monitor the progress of the remedy toward meeting this protective value (beyond the waste management area). Note that there is no current impact on protectiveness, since there is no exposure to site-impacted groundwater.

MassDEP Office of Research and Standards Guidelines (ORSGs) were also considered in the development of the groundwater cleanup levels for contaminants that do not have promulgated MCLs. The ORSG for 1,4-dioxane was updated in May 2011 to 0.3 µg/L, which is lower than the ROD risk-based cleanup level of 4 µg/L. Note, however, that ORSGs are not promulgated. In addition, this is not of concern relative to remedy protectiveness, since there is no exposure to site-impacted groundwater.

In 2016, EPA issued new lifetime drinking water Health Advisories for two per- and polyfluoroalkyl substances (PFAS), including perfluorooctanoic acid (PFOA) at 0.07 µg/L and perfluorooctanesulfonic acid (PFOS) at 0.07 µg/L. MassDEP also issued drinking water guidelines (ORSGs) in June 8, 2018 for five PFAS chemicals, including PFOA, PFOS, perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and

perfluoroheptanoic acid (PFHpA). The ORSG is 0.07 µg/L and applies to the summed concentration of all five compounds. PFAS are a group of emerging contaminants, which are used in a variety of industrial applications and commonly associated with landfills containing industrial and chemical waste. Neither the EPA Health Advisories or the MassDEP ORSGs are enforceable standards. PFAS have not been included in any sampling at the site but are being recommended in future groundwater sampling for Sutton Brook Disposal Area.

Groundwater cleanup levels were identified in the ROD for Aroclor-1254 and alpha-BHC and a surface water cleanup level was identified for 4,4'-DDT. Since the ROD was issued, it was determined that the prior detections of these compounds were likely false positives and monitoring for these compounds has been discontinued (Geosyntec, 2012). Consideration could be given to formally removing these compounds as groundwater and surface water COCs via a future decision document.

Review of Human Health Risk Assessment. Since the 2007 human health risk assessment (HHRA) for Sutton Brook Disposal Area, there have been updates in risk assessment methodology, toxicity values and exposure parameter assumptions. The following section provides an evaluation of the changes that have occurred since 2007, and their impact on the protectiveness of the remedy.

Changes in Toxicity and Other Contaminant Characteristics

Toxicity values have changed since the 2007 risk assessment was performed for Sutton Brook Disposal Area. While some of these changes would potentially increase the cancer risk and non-cancer hazard associated with the exposures to soil and groundwater evaluated, these toxicity changes do not affect the current protectiveness of the remedy, because source control measures and institutional controls will prevent exposures.

- **2011 TCE** cancer and non-cancer toxicity values

On September 28, 2011, EPA finalized the December 2009 revised toxicity values for TCE. The new values indicate that TCE is more toxic from both cancer and non-cancer health effects. These toxicity changes would result in increased non-cancer hazard and cancer risk from exposure to TCE. At Sutton Brook Disposal Area, there is a cleanup level for TCE in groundwater which is set at the MCL. There is no current exposure to site-impacted groundwater, and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

- **2012 PCE** cancer and non-cancer toxicity values

On February 10, 2012, EPA finalized the cancer and non-cancer toxicity values for PCE. These new values indicate that PCE is now more toxic from cancer health effects but less toxic from non-cancer hazard effects. These toxicity changes would result in an increased cancer risk and a decreased non-cancer hazard from exposure to PCE. At Sutton Brook Disposal Area, there is a cleanup level for PCE in groundwater which is set at the MCL. There is no current exposure to site-impacted groundwater and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

- **2016 PFOA/PFOS** non-cancer toxicity values

In May 2016, EPA issued final lifetime drinking water health advisories for PFOA and PFOS, which identified a chronic oral reference dose (RfD) of $2x10^{-5}$ mg/kg-day for PFOA and PFOS (USEPA, 2016a and USEPA, 2016b). These RfD values should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFOA and PFOS might be present based on site history. Potential estimated health risks from PFOA and PFOS, if identified, would likely increase total site risks due to

groundwater exposure. Further evaluation of potential risks from exposure to PFOA and PFOS in other media at the site might be needed based on site conditions and may also affect total site risks. There is no current exposure to site-impacted groundwater and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

- **2014 PFBS** non-cancer toxicity value

Perfluorobutanesulfonic acid (PFBS) has a chronic oral RfD of $2x10^{-2}$ mg/kg-day based on an EPA Provisional Peer Reviewed Toxicity Value (PPRTV) (USEPA, 2014c). This RfD value should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFBS might be present based on site history. Potential estimated health risks from PFBS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFBS in other media at the site might be needed based on site conditions and may also affect total site risks. There is no current exposure to site-impacted groundwater, and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

PFOA, PFOS, and PFBS belong to a group of compounds known as PFAS, which are used in a variety of industrial applications and commonly associated with landfills containing industrial and chemical waste. Sampling for PFAS in groundwater has not yet been done at the site, but is being recommended for the next FYR period. As noted above, these new toxicity values do not affect the current protectiveness of the remedy.

- **1,4-Dioxane** cancer and non-cancer toxicity values

In 2013, EPA revised the toxicity values for 1,4-dioxane. The oral slope factor increased, while the value for inhalation unit risk decreased, which indicates that 1,4-dioxane is more toxic from cancer health effects via the oral pathway, but less toxic from inhalation. Additionally, the non-cancer values for oral reference dose and inhalation reference concentration both decreased, which indicates that 1,4-dioxane is more toxic from non-cancer hazards. At Sutton Brook Disposal Area, there is a cleanup level for 1,4-dioxane in groundwater at 4 µg/L which was set at a cancer risk-based level of $1x10^{-6}$. Using the current toxicity values for 1,4-dioxane, this groundwater cleanup level at 4 µg/L would result in an estimated cancer risk of $9x10^{-6}$, which is within EPA acceptable risk range. There is no current exposure to site-impacted groundwater, and institutional controls, once implemented, will prevent future exposures until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

- **2016 Lead** in soil cleanups

EPA's 2016 Office of Land and Emergency Management (OLEM) memorandum "Updated Scientific Considerations for Lead in Soil Cleanups" (OLEM Directive 9200.2-167) indicates that adverse health effects are associated with blood lead levels (BLLs) at less than 10 µg/dL. The memo mentioned that several studies have observed "clear evidence of cognitive function decrements in young children with mean or group BLLs between 2 and 8 µg/dL." Any soil screening, action or cleanup level developed based on previous BLL of 10 µg/dL may not be protective.

EPA's approach to evaluate potential lead risks is to limit exposure to residential and commercial soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of the population exceeding a 5 µg/dL BLL. This is based on evidence indicating cognitive impacts at BLLs below 10 µg/dL. Additionally, this approach aligns with the Lead Technical Review Workgroup's current support for using a BLL of 5 µg/dL as the level of concern in the Integrated Exposure Uptake Biokinetic Model (IEUBK) and Adult Lead Methodology (ALM). A target BLL of 5 µg/dL reflects

current scientific literature on lead toxicology and epidemiology that provides evidence that the adverse health effects of lead exposure do not have a threshold.

EPA's 2017 OLEM memorandum "Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters" (OLEM Directive 9285.6-56) provides updates on the default baseline blood lead concentration and default geometric standard deviation input parameters for the Adult Lead Methodology. These updates are based on the analysis of the NHANES 2009-2014 data, with recommended updated values for baseline blood lead concentration being 0.6 µg/dL and geometric standard deviation being 1.8.

Using updated default IEUBK and ALM parameters at a target BLL of 5 µg/dL, site-specific lead soil screening levels (SLs) of 200 ppm and 1,000 ppm are developed for residential and commercial/industrial exposures, respectively.

As presented above in the Data Review section and from Appendix D, the GSA confirmatory soil sampling results showed a maximum lead detection of 73.4 mg/kg at GSA-4 location. This is well below the site-specific lead soil screening level of 200 ppm for residential exposure. Further review of the lead concentrations for the various data groupings included in the HHRA also showed concentrations below 200 ppm. This update to the lead approach would not impact the current protectiveness of the remedy. Lead concentrations in soil outside the landfill cap are below SLs, the landfill cap is functioning as intended, and ICs will be put in place, preventing contact with any soil contamination that could pose a human health risk if there are any lead concentrations above screening levels in the landfill lobes. If land use or site conditions were to change in the future, lead may need to be re-evaluated.

- **2017 Polycyclic Aromatic Hydrocarbons (PAHs)** cancer and non-cancer toxicity values

On January 19, 2017, EPA issued revised (less carcinogenic) cancer toxicity values and new non-cancer toxicity values for benzo(a)pyrene. Benzo(a)pyrene did not have non-cancer toxicity values prior to January 19, 2017. Benzo(a)pyrene is now considered to be carcinogenic by a mutagenic mode of action; therefore, cancer risks must be evaluated for different human developmental stages using age dependent potency adjustment factors (ADAFs) for different age groups. The cancer potency of other carcinogenic PAHs is adjusted by the use of relative potency factors (RPFs), which are expressed relative to the potency of benzo(a)pyrene. The non-cancer effects of benzo(a)pyrene were not evaluated in the past due to the absence of non-cancer values. At Sutton Brook Disposal Area, there were risk-based soil cleanup levels for PAHs at the GSA, set at a cancer risk of $1x10^{-5}$ (see Appendix C). The remedy performed at the GSA achieved these cleanup levels. Using the current toxicity values, the cleanup levels would be higher for the same risk level. Therefore, these changes do not affect the protectiveness of the remedy.

Although calculated risks for the site may differ from those previously estimated, slightly higher for some contaminants and slightly lower for others, the revised toxicity values discussed in this section are not expected to affect the protectiveness of the remedy because there is no current exposure to site contaminants.

Changes in Risk Assessment Methods

There have been multiple changes to EPA's risk assessment methodologies since the 2007 risk assessment. As noted above, the source control measures and planned institutional controls prevent exposures and therefore changes in methodologies do not affect the current protectiveness of the remedy for the site.

- **2014 OSWER Directive Determining Groundwater Exposure Point Concentrations, Supplemental Guidance**

In 2014, EPA finalized a Directive to determine groundwater exposure point concentrations (EPCs). https://www.epa.gov/sites/production/files/2015-11/documents/OSWER-Directive-9283-1-42-GWEPC-2014.pdf. This Directive provides recommendations to develop groundwater EPCs. The recommendations to calculate the 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration for each contaminant from wells within the core/center of the plume. Using the statistical software ProUCL could result in lower groundwater EPCs than the maximum concentrations routinely used for EPCs as past practice in risk assessment, leading to changes in groundwater risk screening and evaluation. In general, this approach could result in slightly lower risk or higher screening levels (USEPA, 2014a). With the levels of groundwater contamination detected at Sutton Brook Disposal Area, this change would not have resulted in a different risk determination at the site. However, it may be appropriate to utilize these recommendations during any future evaluations performed as concentrations decrease and the site approaches closure.

- **2014 OSWER Directive on the Update of Standard Default Exposure Factors**

In 2014, EPA finalized a Directive to update standard default exposure factors and frequently asked questions associated with these updates. https://www.epa.gov/sites/production/files/2015-11/documents/oswer_directive_9200.1-120_exposurefactors_corrected2.pdf. Many of these exposure factors differ from those used in the risk assessment supporting the 2007 ROD. These changes in general would result in a slight decrease of the risk estimates for most chemicals. (Reference: USEPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. Feburuary 6, 2014.)

There is no current exposure to site-impacted groundwater, and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the standard default exposure factors.

- **2018 EPA VISL Calculator**

In February 2018, EPA launched an online Vapor Intrusion Screening Level (VISL) calculator which can be used to obtain risk-based screening level concentrations for groundwater, sub-slab soil gas, and indoor air. The VISL calculator uses the same database as the Regional Screening Levels for toxicity values and physiochemical parameters and is automatically updated during the semi-annual RSL updates. Please see the User's Guide for further details on how to use the VISL calculator. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator.

The 2007 HHRA evaluated vapor intrusion for groundwater at the site and concluded that there was a potential future actionable risk in the area of the FDDA for future resident due to toluene and total xylenes and future facility worker due to total xylenes.

Using the VISL calculator, recent groundwater results (October 2018) in the downgradient area were evaluated (see Appendix D for data and table in Appendix D.5 showing VISL comparison results). Results show no exceedances of target groundwater concentrations set at an HI=1 and risk level of 10^{-4}. Only benzene showed an exceedance of target groundwater concentrations set at an HI=1 and risk level of 10^{-6}. These results show that current groundwater levels do not result in significant potential vapor intrusion risk, as was the case at the time of the ROD.

EPA updates Regional Screening Level tables twice a year and the most current ones are available at the EPA Regional Screening Levels web page (https://www.epa.gov/risk/regional-screening-levels-rsls), updated November 2018.

Changes in Exposure Pathways/Assumptions

There have been no changes to the exposure pathways evaluated in the 2007 HHRA. As noted above, there have been changes to exposure parameters, but these do not affect the protectiveness of the remedy.

Review of Ecological Risk Assessment. The ecological risk assessment, including a Screening-Level Ecological Risk Assessment and a Baseline Ecological Risk Assessment (SLERA and BERA) for Sutton Brook Disposal Area Superfund Site was conducted using methodology that would generally comply with current EPA risk assessment guidance. The BERA (Woodard & Curran, 2007) concluded there were unacceptable ecological risks from exposure of terrestrial plants and wildlife in upland soil, aquatic invertebrates in Upper Sutton Brook sediments and aquatic life in Upper Sutton Brook surface water. The ROD documents these results and the cleanup levels established based on the BERA. Following the BERA, there was additional evaluation of risk in order to establish revised performance standards for Sutton Brook sediment and surface water and the FDDA soils (Geosyntec, 2013; Appendix C-2 of the Final [100%] Design Report). This refinement (ERA Update) was conducted since the 2007 BERA established only conservative, NOAEL-based risk levels for FDDA soils and sediments in Upper Sutton Brook, based on the assumption of unacceptable risk in these exposure areas. The ERA update, provided as Appendix C2 of the 100% Remedial Design (2013), supplemented the evaluation of risk using methods that closely comply with current EPA risk assessment guidance. This update included additional soils data, and refined exposure and toxicity estimates. The primary discrepancies between current guidance and previous guidance exist in the areas of benchmarks and toxicity values utilized. There are also minor differences in the recommended toxicity testing approaches and in the factors used in wildlife modeling. There are no newly promulgated standards, relevant to the site ERA, which bear on the protectiveness of the remedy. Exceedances of water quality criteria related to compliance monitoring are discussed in other sections of this report.

Ecological Standards review

Since the risk evaluations performed in 2007 and 2013, there have not been any significant changes in recommended ecological benchmarks utilized for sediment or soil, and only a limited number of changes in National Recommended Water Quality Criteria (NRWQC) values for surface water. The NRWQC changes include new standards for aluminum, cadmium, selenium, and ammonia. If lower NRWQC values were used to screen the surface water data, the maximum concentration may have resulted in selecting aluminum, cadmium and selenium as preliminary Contaminants of Potential Concern (COPCs) in the SLERA. However, the limited number and low levels of the detected values indicate these metals would not have been determined in further evaluation to represent a significant risk. Consequently, a review of the standards and the current surface water, sediment and soil data indicate there are no newly promulgated standards, relevant to the site, which bear on the protectiveness of the remedy.

Ecological Changes in Exposure Pathways

Ecological routes of exposure have been changed by implementation of the remedy. Excavation of contaminated sediments above site-specific cleanup levels from Sutton Brook between the landfill lobes during the remedial action, reduced the potential for exposure to aquatic life to the receptors in Sutton Brook. In addition, construction of a multi-layer impermeable cap over the landfill lobes has reduced the potential for site-related contaminants from reaching Sutton Brook. The pathway for plants, invertebrates, and wildlife to be exposed soils at the GSA and the FDDA has been removed from the areas from which the soil has been removed. The removal of contaminants from these areas has contributed to the reduction in exposure and effectiveness of the remedy.

Expected Progress Towards Meeting RAOs

The remedial actions which have taken place at the site have addressed current human health and ecological risks at the site. ICs are still required to be implemented for maintaining future protectiveness. The following paragraphs discuss the residual chemicals at the site following remedial actions taken to date. These residuals are evaluated regarding achieving goals put forth in the RAOs.

GSA and FDDA Soil. A review of the GSA confirmatory soil sampling results (see Data Review section above) as they relate to current human health risk screening levels (using updated toxicity values and current methods), show that the residual soil cancer risk for a residential exposure is $1x10^{-5}$, which is within EPA's target risk range of 10^{-4} to 10^{-6}. For the FDDA confirmatory soil sampling results (see Data Review section above), current Soil Screening Levels (SSLs; used for protection of the soil-to-groundwater pathway) are all equal to or higher than the ones used during the remedial action. As any previous exceedances were shown to be acceptable either through Synthetic Precipitation Leaching Procedure (SPLP) sampling or due to depth (below water table), the remedy in this area is still considered protective.

Performance standards for ecological receptors in soils for the FDDA were revised in the Final Design for four VOCs; cleanup levels in soils were established for GSA soils (lead, zinc, and di-n-octylphthalate) in the ROD (see Appendix C of this five-year review). Sampling results from 2014 indicated some exceedances of the lead cleanup level and one exceedance of the di-n-octylphthalate cleanup level in samples from the confirmatory samplingfor the GSA. No other samples have been collected. In the FDDA, data from the construction completion report, collected in 2014/2015 indicated no exceedances of performance standards for the four ecological COCs.

Groundwater. MNA of groundwater is still being evaluated. At this time, the plume does not appear to be expanding, so the remedy appears to remain protective.

Surface Water. Performance standards were revised in the Final Design (see Appendix C of this five-year review) for three VOCs in the surface water of Sutton Brook. Surface water sampling conducted from 2011 to 2018 showed no exceedances of the revised performance standards. In addition, most of the detected concentration of the VOCs with performance standards based on ecological risk were low, and below NOAEL screening levels as well, with exception of some low detections of toluene in 2011-2015. In 2017 and 2018 sampling results, there were very few detections of any of the sampled VOCs (with corresponding low reporting limits), demonstrating the effectiveness of the remedy toward reducing the COC levels and compliance with performance standards in surface water.

Sediment. Performance standards for sediments were revised in the Final Design (see Appendix C of this five-year review) for sediments in Upper Sutton Brook for five VOCs and two SVOCs. The maximum detected concentrations from sampling conducted from 2015 showed no exceedances of the revised performance standards. The few COC exceedances in deeper record samples in 2015 were from samples collected 24 inches below the sediment surface and were backfilled over during the remedial action. During monitoring in 2018, there were no exceedances of performance standards, with the exception of 2-methylphenol, 3-methylphenol and 4-methylphenol, which had reporting limits that exceeded the performance standards. The first post-construction monitoring in 2018 demonstrated the effectiveness of the remedy toward reducing the COC levels and compliance with performance standards in sediments of Sutton Brook.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
N/A

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Other (PFAS)			
	Issue: Groundwater monitoring has not included analysis for PFAS, so it is unclear if these chemicals are of potential concern at the site.			
	Recommendation: Include analysis for PFAS in an upcoming groundwater monitoring event to determine if these compounds are of potential concern at the site.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	5/19/2023

OU(s): 1	Issue Category: Monitoring			
	Issue: A future Explanation of Significant Differences (ESD) would be required to change the 1,4-dichlorobenzene groundwater cleanup level to the more stringent MMCL.			
	Recommendation: A CERCLA decision document to incorporate a change to the 1,4-dichlorobenzene groundwater cleanup level into the remedy should be completed before the next five-year review.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA		5/19/2024

OU(s): 1	Issue Category: Institutional Controls			
	Issue: Institutional controls restricting inappropriate land uses (including temporary ICs to prevent the use of groundwater beyond the landfill's compliance boundary until groundwater cleanup standards are achieved) and protecting the landfill cap and other components of the remedy need to be established.			
	Recommendation: Discussions between EPA, MassDEP, and the property owners are ongoing. Upon completion of discussions between the parties, institutional controls should be established by the end of 2020.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State	EPA	12/31/2020

OTHER FINDINGS

As noted earlier, the MNA portion of the remedy is still under evaluation. Annual reports include review of contaminant trends at individual wells, review of any plume expansion, changes in land and/or groundwater use, changes in environmental conditions, and rate of decrease in contaminant concentrations. By the next FYR (2024), it is anticipated that there will be enough of a data set to determine the adequacy of the MNA portion of the remedy to achieve RAOs within the timeframe anticipated in the ROD.

VII. PROTECTIVNESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: N/A	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy currently protects human health and the environment, as exposure pathways that could result in unacceptable risks are being controlled. The landfill caps are in place, fencing encompasses the area to prevent access, and there is no current use of groundwater. However, in order for the remedy to be protective in the long-term, institutional controls will need to be implemented to restrict inappropriate land uses (including use of groundwater) and protect the landfill caps and other components of the remedy.	

VIII. NEXT REVIEW

The next five-year review report for the Sutton Brook Disposal Area Superfund Site is required five years from the completion date of this review, which will be on May 19, 2024.

Appendix A
Reference List

Comprehensive Environmental Inc. (CEI), 2018. *Sutton Brook Disposal Area Wetland Mitigation Monitoring Report.* November 2018.

Geosyntec, 2012. *Addendum No. 1, Environmental Monitoring Plan, Sutton Brook Disposal Site, Tewksbury, MA.* February 10, 2012.

Geosyntec, 2013. *Final (100%) Design Report, Sutton Brook Disposal Area Superfund Site, Revision 1*. July 16, 2013.

Geosyntec, 2016a. *Construction Report, Sutton Brook Disposal Area Superfund Site*. September 2016.

Geosyntec, 2016b. *Operations and Maintenance Plan, Sutton Brook Disposal Area Superfund Site*. December 2016.

GES, 2018. *Post Construction Operation, Maintenance and Monitoring Report (July 2018 – September 2018), Sutton Brook Disposal Area Superfund Site, Tewksbury, Massachusetts*. October 11, 2018.

GES, 2019. *Post Construction Operation, Maintenance and Monitoring Report (October 2018 – December 2018), Sutton Brook Disposal Area Superfund Site, Tewksbury, Massachusetts*. January 8, 2019.

United States Environmental Protection Agency (USEPA), 2007. *Record of Decision. Sutton Brook Disposal Area Superfund Site, Tewksbury, Massachusetts.* September 27, 2007.

USEPA, 2014a. *Determining Groundwater Exposure Point Concentrations.* OSWER Directive 9283.1-42. February 2014.

USEPA, 2014b. *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors.* OSWER Directive 9200.1-120. February 6, 2014.

USEPA, 2014c. *Provisional Peer-Reviewed Toxicity Values for Perfluorobutane Sulfonate and Related Compound Potassium Perfluorobutane Sulfonate.* Office of Research and Development. EPA 690-R-14-012F. July 17, 2014.

USEPA, 2016a. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA).* Office of Water. EPA 822-R-16-005. May 2016.

USEPA, 2016b. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Office of Water. EPA 822-R-16-004. May 2016.

Woodard & Curran, 2007. *Remedial Investigation and Feasibility Study, Sutton Brook Disposal Area Superfund Site, Tewksbury, Massachusetts.* February 2007.

Appendix B
Site Walkover Photos and Inspection Summary

B.1 – Site Walkover Photos



View of southern slope of Northern lobe (groundhog burrow observed)



Detention Basin B



Sutton Brook crossing between landfill lobes



Southern lobe near Sutton Brook crossing



Extraction well during cleaning



Wetland near Detention Basin C



Downchute near Detention Basin D



Meter vault

B.2 – Inspection Summary

Five-Year Review Site Inspection Checklist

("N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: Sutton Brook Disposal Area	**Date of inspection:** December 6, 2018
Location and Region: Tewksbury, MA; Region I	**EPA ID:** MAD980520696
Agency, office, or company leading the five-year review: USEPA/AECOM	**Weather/temperature:** Clear/30°F
Remedy Includes: (Check all that apply) X Landfill cover/containment X Access controls X Institutional controls □ Groundwater pump and treatment □ Surface water collection and treatment □ Other_____ _____	X Monitored natural attenuation X Groundwater containment X Vertical barrier walls
Attachments: □ Inspection team roster attached □ Site map attached	
II. INTERVIEWS	
Interviews were performed by USEPA and are included separately.	

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
	Remarks: Not reviewed prior to inspection			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
	Remarks: Not reviewed prior to inspection			
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A
	Remarks: Not reviewed prior to inspection			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	X N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	X N/A
	X Waste disposal, POTW	☐ Readily available	X Up to date	☐ N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	X N/A
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	X N/A
	Remarks: Not part of O&M			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	X N/A
	Remarks: No settlement monuments			
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	☐ N/A
	Remarks:			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	X N/A
	Remarks:			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	X Water (effluent)	X Readily available	X Up to date	☐ N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A
	Remarks: Not reviewed			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐Contractor for State
☐ PRP in-house X Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____
_____

2. **O&M Cost Records**

Not Reviewed

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: None noted during review of monthly reports and during_____
_____discussion with EPA Remedial Project Manager_____
_____
_____
_____
_____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map X Gates secured ☐ N/A

Remarks: Historic damage has been repaired immediately upon discovery.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map X N/A

Remarks_____
_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No X N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No X N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No X N/A
Reports are verified by the lead agency ☐ Yes ☐ No X N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No X N/A
Violations have been reported ☐ Yes ☐ No X N/A
Other problems or suggestions: ☐ Report attached
ICs being developed_____
_____
_____
_____

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate X N/A
Remarks_____
_____
_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map X No vandalism evident
Remarks_____
_____

2. **Land use changes on site** ☐ N/A
Remarks____No changes yet, but solar development possible in the near future._____
_____

3. **Land use changes off site** X N/A
Remarks_____
_____

VI. GENERAL SITE CONDITIONS

A. Roads X Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map X Roads adequate ☐ N/A
Remarks_____
_____

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS X Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map X Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Cracks** ☐ Location shown on site map X Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ☐ Location shown on site map ☐Holes not evident
   Areal extent_____ Depth_____
   Remarks__Some burrows here and there. Most look like they have been filled already._____
   _____

5. **Vegetative Cover** X Grass X Cover properly established X No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** X N/A
   Remarks_____
   _____

7. **Bulges** ☐ Location shown on site map X Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

8. **Wet Areas/Water Damage** X Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks_____
_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map X No evidence of slope instability
Areal extent_____
Remarks_____
_____

B. Benches X Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map X N/A or okay
Remarks_____
_____

2. **Bench Breached** ☐ Location shown on site map X N/A or okay
Remarks_____
_____

3. **Bench Overtopped** ☐ Location shown on site map X N/A or okay
Remarks_____
_____

C. Letdown Channels X Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map X No evidence of settlement
Areal extent_____ Depth_____
Remarks_____
_____

2. **Material Degradation** ☐ Location shown on site map X No evidence of degradation
Material type_____ Areal extent_____
Remarks_____
_____

3. **Erosion** ☐ Location shown on site map X No evidence of erosion
Areal extent_____ Depth_____
Remarks_____
_____

4. **Undercutting** ☐ Location shown on site map X No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ X No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
X Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____

Remarks: There is some growth which should be removed, but there is no evidence of standing water.

D. Cover Penetrations X Applicable ☐ N/A

1. **Gas Vents** ☐ Active X Passive
☐ Properly secured/locked X Functioning ☐ Routinely sampled X Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A

Remarks: _____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance X N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance X N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance X N/A
Remarks_____
_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed X N/A
Remarks_____
_____

E. Gas Collection and Treatment ☐ Applicable X N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance X N/A
   Remarks_____
   _____

F. Cover Drainage Layer X Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

   Remarks: Not inspected

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

   Remarks: Not inspected

G. Detention/Sedimentation Ponds X Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident

   Remarks: Siltation and vegetative growth was observed in some ponds. Detention basins still appear to be functioning properly.

2. **Erosion** Areal extent_____ Depth_____
   X Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** X Functioning ☐ N/A
   Remarks__Groundwater levels are high and there has been excessive rain during the fall months, so ponds had water in them._____
   _____

4. **Dam** ☐ Functioning X N/A
   Remarks_____
   _____

H. Retaining Walls □ Applicable X N/A

1. **Deformations** □ Location shown on site map □ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

2. **Degradation** □ Location shown on site map □ Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge X Applicable □ N/A

1. **Siltation** □ Location shown on site map X Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** □ Location shown on site map □ N/A
   X Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks____Normal maintenance should keep vegetative growth down._____
   _____

3. **Erosion** □ Location shown on site map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** X Functioning □ N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS X Applicable □ N/A

1. **Settlement** □ Location shown on site map X Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring:_Water level_____
   □ Performance not monitored
   Frequency_____ □ Evidence of breaching
   Head differential_____
   Remarks_____Reviewed as part of monitoring reports_____
   _____

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines X Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   X Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks___Pump was out of vault at time of inspection for cleaning_____
   _____
   _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   X Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____
   _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____
   _____

C. Treatment System ☐ Applicable X N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually_____
   ☐ Quantity of surface water treated annually_____
   Remarks_____
   _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks_____
   _____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks_____
   _____

6. **Monitoring Wells** (pump and treatment remedy)
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____

D. Monitoring Data

1. Monitoring Data
   X Is routinely submitted on time X Is of acceptable quality

2. Monitoring data suggests:
   X Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks__Did not go to all wells during inspection, but the ones observed appear secured and in good condition_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

None

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The source control remedy appears to be operating as designed and the equipment for groundwater management appears to be in good shape.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The landfill cover and associated components are well-maintained.
Monitoring continues to be performed and submitted in a timely fashion.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted at this time.

Appendix C
Cleanup Levels and Performance Standards

C.1 – Original ROD Cleanup Levels

Table L-1: Groundwater Cleanup Levels - Residential Scenario

Carcinogenic Chemical of Concern	Cancer Classification	Cleanup Level (ug/L)	Basis	RME Risk
1,1,2-Trichloroethane	C	5	MCL	3E-05
1,2-Dichloroethane	B2	5	MCL	4E-05
1,2-Dichloropropane	N/A	5	MCL	6E-06
1,4-Dichlorobenzene	N/A	75	MCL	5E-05
1,4-Dioxane	B2	4	risk	1E-06
Acrylonitrile	B1	0.05	risk	1E-06
Benzene	A	5	MCL	2E-05
Carbon Tetrachloride	B2	5	MCL	3E-05
Chloroform	B2	80	MCL	6E-04
Methylene chloride	B2	5	MCL	1E-06
Tetrachloroethene	B1	5	MCL	7E-05
Trichloroethene	N/A	5	MCL	4E-05
Vinyl Chloride	A	2	MCL	6E-05
alpha-BHC	B2	0.008	risk	1E-06
Aroclor-1254	B2	0.5	MCL	3E-06
bis(2-Ethylhexyl)phthalate	B2	6	MCL	3E-06
N-Nitrosodi-n-butylamine	B2	0.003	risk	1E-06
N-Nitrosopyrrolidine	B2	0.03	risk	1E-06
o-Toluidine	N/A	0.2	risk	8E-07
Arsenic	A	10	MCL	2E-04
Non-Carcinogenic Chemical of Concern	**Target Endpoint**	**Cleanup Level (ug/L)**	**Basis**	**RME Hazard Quotient**
1,1,1-Trichloroethane[1]	Liver	200	MCL	8E-02
1,1-Dichloroethane	CNS	360	HQ	1E+00
1,1-Dichloroethene [1]	Liver	7	MCL	5E-02
1,2-Dichloroethene (total)	Liver	100	MCL	3E+00
1,4-Dioxane	Liver	4	risk	3E-03
2-Butanone	Developmental	4000	Health Advisory	7E-01
4-Methyl-2-pentanone	Liver; Kidney	800	HQ	1E+00
Acetone	Kidney	5600	HQ	1E+00
Acrylonitrile	Reproductive	0.05	risk	1E-02
Benzene	Immune System	5	MCL	3E-01
Carbon tetrachloride	Liver	5	MCL	3E+00
cis-1,2-Dichloroethene	Blood	70	MCL	2E+00
Ethyl methacrylate	Kidney	260	HQ	1E+00
Ethylbenzene	Liver; Kidney	700	MCL	2E+00
Methylene chloride	Liver	5	MCL	9E-03
n-Propylbenzene	N/A	52	HQ	1E+00
Styrene [1]	Blood; Liver	100	MCL	2E-01 [1]
Tetrahydrofuran	N/A	227	HQ	1E+00
Toluene	Kidney	1000	MCL	2E+00
Vinyl chloride	Liver	2	MCL	9E-02
Xylenes (total)	General Toxicity	10000	MCL	1E+02
2-Methylphenol	General Toxicity; CNS	540	HQ	1E+00
3-/4-Methylphenol	General Toxicity; CNS	470	HQ	1E+00
bis(2-Ethylhexyl)phthalate	Liver	6	MCL	5E-02
Naphthalene	General Toxicity	100	Health Advisory	3E+01
Phenol	Developmental	2000	Health Advisory	6E-01
Pyridine	Liver	9	HQ	1E+00
Aroclor-1254	Immune system	0.5	MCL	2E+00
Antimony	General Toxicity	6	MCL	1E+00
Arsenic	Skin	10	MCL	3E+00
Beryllium	Gastrointestinal System	4	MCL	3E-01
Cadmium	Kidney	5	MCL	9E-01
Chromium	Gastrointestinal System	100	MCL	2E+01
Lead [1]	CNS	15	MCL	NA
Manganese	CNS	300	Health Advisory	6E-01
Selenium [1]	Liver	50	MCL	7E-01
Silver	Skin	100	Health Advisory	2E+00
Thallium	Blood	2	MCL	2E+00
Zinc	Blood	2000	Health Advisory	5E-01

Key

Health Advisory - Lifetime Health Advisory presented in EPA-822-R-04-005: Winter 2004

MCL - Maximum Contaminant Level

HQ - Hazard Quotient

NA - Not applicable

(1) This contaminant did not exceed a hazard quotient of 1 during calculations. However, the maximum detected concentration exceeded MCLs. Therefore, the cleanup level has been established as the MCL

Table L-2: Soil Cleanup Levels for the Protection of Residential Direct Contact Exposures				
Group 4, Upland Soil				
Carcinogenic Chemical of Concern	**Cancer Classification**	**Cleanup Level (mg/kg)**	**Basis**	**RME Risk**
Benzo(a)anthracene	N/A	4.4	risk	1E-05
Benzo(a)pyrene	B2	0.44	risk	1E-05
Benzo(b)fluoranthene	B2	4.4	risk	1E-05
Benzo(k)fluoranthene	B2	44	risk	1E-05
Dibenz(a,h)anthracene	B2	0.44	risk	1E-05
Indeno(1,2,3-cd)pyrene	B2	4.4	risk	1E-05
			Sum of Carcinogenic Risk:	6E-05
Key				

Table L-3: Soil Cleanup Levels for the Protection of Ecological Receptors

Habitat Type/Name	Exposure Medium	COC	Protective Level	Units	Basis	Assessment Endpoint
Former Drum Disposal Area	Soil	1,2,4-Trimethylbenzene	1.1	mg/kg	Site-Specific NOAEL	- Sustainability (survival, growth, reproduction) of local populations of carnivorous wildlife (robin) - survival and growth of invertebrtates - abundance and diversity of plants
		1,3,5-Trimethylbenzene	1.1	mg/kg	Site-Specific NOAEL	
		bis(2-Ethylhexyl)phthalate	2.3	mg/kg	HQ = 0.1	
		Di-n-octylphthalate	0.1	mg/kg	HQ = 0.1	
		Ethylbenzene	1.1	mg/kg	Site-Specific NOAEL	
		Naphthalene	1	mg/kg	Site-Specific NOAEL	
		Toluene	1.1	mg/kg	Site-Specific NOAEL	
		Xylenes (total)	1.1	mg/kg	Site-Specific NOAEL	
Garage and Storage Area	Soil	Di-n-octylphthalate	0.4	mg/kg	HQ = 0.1	- Sustainability (survival, growth, reproduction) of local populations of carnivorous wildlife (robin) - survival and growth of invertebrtates
		Lead	65	mg/kg	HQ = 0.1	
		Zinc	190	mg/kg	Site-Specific LOAEL	

Notes:

HQ - Hazard Quotient
NOAEL - No Observable Adverse Effect Level
COC - Chemical of Concern
LOAEL - Lowest Observable Adverse Effect Level

Table L-4: Surface Water Cleanup Levels for the Protection of Ecological Receptors

Habitat Type/Name	Exposure Medium	COC	Protective Level	Units	Basis	Assessment Endpoint
Upper Sutton Brook - Site Channel	Surface Water	4,4'-DDT	0.001	ug/L	NRWQC	- Survival and growth of potential fish and invertebrate communities
		Ethylbenzene	7.3	ug/L	Site-Specific NOAEL	
		Toluene	9.8	ug/L	Site-Specific NOAEL	
		Xylenes (total)	13	ug/L	Site-Specific NOAEL	

Notes:

NOAEL - No Observable Adverse Effect Level

COC - Chemical of Concern

NRWQC - National Recommended Water Quality Criterion

Table L-5: Sediment Cleanup Levels for the Protection of Ecological Receptors

Habitat Type/Name	Exposure Medium	COC	Protective Level	Units	Basis	Assessment Endpoint
Upper Sutton Brook - Site Channel	Sediment	1,2,4-Trimethylbenzene	1.3	mg/kg	Site-Specific NOAEL	- Survival and growth of local populations of benthic invertebrates
		1,3,5-Trimethylbenzene	1.2	mg/kg	Site-Specific NOAEL	
		2-Methylphenol	0.1	mg/kg	Site-Specific NOAEL	
		3-/4-Methylphenol	0.6	mg/kg	Site-Specific NOAEL	
		4-Methyl-2-pentanone	0.04	mg/kg	Site-Specific NOAEL	
		Acetone	0.07	mg/kg	Site-Specific NOAEL	
		Carbon Disulfide	0.001	mg/kg	Site-Specific NOAEL	
		Chloroethane	0.03	mg/kg	Site-Specific NOAEL	
		Ethylbenzene	0.09	mg/kg	Site-Specific NOAEL	
		Toluene	0.06	mg/kg	Site-Specific NOAEL	
		Xylenes (total)	0.13	mg/kg	Site-Specific NOAEL	

Notes:

NOAEL - No Observable Adverse Effect Level
COC - Chemical of Concern

C.2 – Revised Performance Standards Developed During Design

Table 3
Target Constituents and Performance Standards - FDDA Soils
Sutton Brook Disposal Area Superfund Site - Tewksbury, Massachusetts

Detected Constituent	CAS	Units	Revised Performance Standard				ROD Value
			0-2 feet bgs		>2 feet bgs		
			Value	Basis	Value	Basis	
Naphthalene	91-20-3	µg/kg	9.4	Soil Screening Level	9.4	Soil Screening Level	1000
Bis(2-Ethylhexyl) phthalate	117-81-7	µg/kg	28,000	Soil Screening Level	28,000	Soil Screening Level	2300
Di-n-octylphthalate	117-84-0	µg/kg	34,000	Ecological Based CTL	N/A	Soil Screening Level	100
1,1,1-Trichloroethane	71-55-6	µg/kg	1,400	Soil Screening Level	1,400	Soil Screening Level	n/a
1,1-Dichloroethane	75-34-3	µg/kg	13.6	Soil Screening Level	13.6	Soil Screening Level	n/a
1,2,4-Trimethylbenzene	95-63-6	µg/kg	420	Soil Screening Level	420	Soil Screening Level	1,100
1,3,5-Trimethylbenzene	108-67-8	µg/kg	2,400	Soil Screening Level	2,400	Soil Screening Level	1,100
2-Butanone (MEK)	78-93-3	µg/kg	20,000	Soil Screening Level	20,000	Soil Screening Level	n/a
4-Methyl-2-pentanone (MIBK)	108-10-1	µg/kg	4,600	Soil Screening Level	4,600	Soil Screening Level	n/a
Ethylbenzene	100-41-4	µg/kg	15,600	Soil Screening Level	15,600	Soil Screening Level	1,100
Methylene chloride	75-09-2	µg/kg	26	Soil Screening Level	26	Soil Screening Level	n/a
n-Propylbenzene	103-65-1	µg/kg	9,500	Ecological Based CTL	19,800	Soil Screening Level	n/a
Tetrachloroethene	127-18-4	µg/kg	46	Soil Screening Level	46	Soil Screening Level	n/a
Toluene	108-88-3	µg/kg	13,800	Soil Screening Level	13,800	Soil Screening Level	1,100
Trichloroethene	79-01-6	µg/kg	36	Soil Screening Level	36	Soil Screening Level	n/a
Xylenes, total	1330-20-7	µg/kg	196,000	Soil Screening Level	196,000	Soil Screening Level	1,100

Notes:

Refer to Table 22 of the Updated Risk Assessment for the Ecological Based CTL

Soil Screening Levels (SSLs) are based on the EPA Regional Screening Table as of April 2012 (refer to Table 1)

The lower of the ecological-based CTL or the SSL is the updated cleanup value for 0-2 feet below ground surface (bgs). Ecological-based CTLs do not apply >2 feet bgs.

See Appendix C-2 of design report for details of updated performance standards.

It should be noted that the laboratory might not be able to achieve the required sensitivity for some of the soil and sediment performance standards due to the high moisture content and the difficult sample matrix interferences associated with high natural organic matter content of those samples. Consultation/feedback from EPA and MassDEP will occur prior to proceeding with laboratory limits greater than the performance standards.

CTL - Cleanup Target Level

Table 5B
Contaminants of Potential Concern

SURFACE WATER

Analyte	ROD Performance Standard	Basis	Updated Performance Standard	Basis
Volatile Organic Compounds				
Ethylbenzene	7.9	BERA/NOAEL	126	MATC
Toluene	9.8	BERA/NOAEL	169	MATC
Xylenes, Total	13	BERA/NOAEL	132	MATC

Notes

The basis for the perfomance standard can be found in the ROD [USEPA, 2007].

4,4'-DDT was deleted from the target constituents for surface water per email approval dated 22 February 2010 from USEPA.

BERA = Baseline Ecological Risk Assessment, Woodard and Curran, May 2007

NOAEL = No Observable Adverse Effects Level

MATC = Maximum Acceptable Toxicant Concentration; see design report Appendix C-2.

-- not applicable

Table 4.8
Target Constituents and Performance Standards - Sediments
Sutton Brook Disposal Area Superfund Site - Tewksbury, Massachusetts

Analyte	ROD Performance Standard *(mg/kg)*	Updated Performance Standard *(mg/kg)*	Basis
Volatile Organic Compounds			
Acetone	0.07	0.31	MATC
4-Methyl-2-pentanone	0.04	8.9	MATC
1,2,4-Trimethylbenzene	1.3	5.0	MATC
1,3,5-Trimethylbenzene	1.2	2.5	MATC
Carbon disulfide	0.001	0.013	MATC
Chloroethane	0.03	0.19	MATC
Ethylbenzene	0.09	1.1	MATC
Toluene	0.06	0.68	MATC
Xylenes	0.13	1.1	MATC
Semi-Volatile Organic Compounds			
2-Methylphenol	0.1	0.12	MATC
3-/4-Methylphenol	0.6	0.11	MATC

Notes:
See Appendix C-2 of design report for details of updated performance standards.
It should be noted that the laboratory might not be able to achieve the required sensitivity for some of the sediment performance standards due to the high moisture content and the difficult sample matrix interferences associated with high natural organic matter content of those samples. Consultation/feedback from EPA and MassDEP will occur prior to
MATC - maximum acceptable toxicant concentration
mg/kg - miligrams per kilogram

Appendix D
Data

D.1 GSA Soil Data
D.2 FDDA Soil Data
D.3 Upper Sutton Brook Sediment Data
D.4 Sutton Brook Surface Water Data
D.5 Groundwater Data

Appendix D.1
GSA Soil Data

Summary of GSA Confirmatory Sampling Results

Analyte	Cleanup Level[1] (mg/kg)	Cleanup Level Basis	Maximum Detection[2] (mg/kg)							Current HH Risk[3]	
			GSA-1	GSA-2	GSA-3	GSA-3 (bot)	GSA-4	GSA-5	Overall	RSL Cancer Risk = 1E-06[4]	Residual Risk[5]
Lead	65	Ecological; HQ = 1[6] (American Robin)	45.2	8.5	**66**	28.2	**73.4**	61.8	73.4	--	
Zinc	190	Ecological site-specific LOAEL; (Invertebrates)	26.2	18.6	NA	NA	NA	101	101	--	
Benzo(a)anthracene	4.4	Human Health; Resident; 1E-05	0.067	0.03	0.51	0.33	0.86	0.62	0.86	1.1	8E-07
Benzo(a)pyrene	0.44	Human Health; Resident; 1E-05	ND	ND	**0.58**	0.31	**1.1**	**0.57**	1.1	0.11	1E-05
Benzo(b)fluoranthene	4.4	Human Health; Resident; 1E-05	0.039	0.005	1.0	0.73	1.4	0.82	1.4	1.1	1E-06
Benzo(k)fluoranthene	44	Human Health; Resident; 1E-05	ND	ND	0.10	0.020	0.49	0.33	0.49	11	4E-08
Dibenz(a,h)anthracene	0.44	Human Health; Resident; 1E-05	ND	ND	0.10	ND	0.021	0.079	0.1	0.11	9E-07
Di-n-octylphthalate	0.4	Ecological; HQ = 1[6] (American Robin)	0.16	0.048	0.32	0.15	**0.52**	0.010	0.52	--	
Indeno(1,2,3-cd)pyrene	4.4	Human Health; Resident; 1E-05	0.19	ND	0.24	0.16	0.32	0.24	0.32	1.1	3E-07
									Cumulative Residual Risk =		1E-05

Notes

1. Cleanup levels from ROD (see Appendix C of this five-year review).
   HQ - Hazard Quotient
   LOAEL - Lowest observable adverse effect level
2. Data are from Construction Completion Report - Appendix D, RFI-C039I and -C039J (included in this appendix). Collected in 2014.
   Sidewall samples collected 6 inches below ground surface.
   For areas GSA-1, -2, and -4, it is the maximum of both sidewall and bottom samples.
   For area GSA-5, it is the maximum of the sidewall samples (bottom sample below the groundwater table).
   For GSA-3, results for the sidewall samples and the bottom sample are separated, as the bottom (subsurface) sample is available for human health exposure anc
   potential leachability in the vadose zone.
   Boldface results exceeded cleanup levels. However, additional evaluations performed during the remedial action (e.g., SPLP sampling or risk evaluations) were used t
   justify the limit of excavation.
   ND - Not detected
   NA - Not available in Construction Completion Report
3. Based on changes in risk exposure parameters and toxicity value changes, residential risk screening levels have changed since the time of the ROD. Presented for evaluation purposes
   HH - Human health
4. RSL - Regional Screening Level; November 2018; Residential Soil; https://www.epa.gov/risk/regional-screening-levels-rsls
5. Determined proportionally using the maximum detections and the RSLs.
6. Note that the ROD incorrectly indicated that the basis was an HQ = 0.1.

Geosyntec consultants

RESPONSE TO RFI-C039I

PROJECT: Sutton Brook Disposal Area	PROJECT No: BE0158C
LOCATION: Tewksbury, Massachusetts	DATE: 8 July 2015
DESCRIPTION: Remedial Action Construction	CONTRACTOR: Charter Environmental

Reference: RFI-C039A-K, received from Charter, dated 15 June 2015 (Attachment A).
Submittals S056D dated 8 May 2015, S056I dated 13 May 2015, and S056L dated 8 April 2015

Response:

Impacted soil in GSA-1 through GSA-4, as identified in the design, was excavated and relocated to the Northern Lobe in July 2014. Post-excavation samples were then collected in accordance with Specification 13020 (see Attachment C for sample locations). Analytical data were received from the laboratory and were validated (laboratory reports and data validation reports were provided under separate cover in Submittals S056D, S056I, and S056L).

Attachment B provides a summary of the data for the compounds with GSA Performance Goals. Based on excavation of the areas identified in the design and the post-excavation sample results, the work in GSA-1 through GSA-4 meets remedy requirements and the areas are ready for backfill.

Signature:  Date: 8 July 2015

FOR INTERNAL USE ONLY

CHANGE ORDER: Does/Will the Request for Information require a Change Order?

☐YES ☒NO ☐Unknown At This Time

Copy to: Charter, EMI, USEPA, AECOM, MassDEP, R. Doherty

ATTACHMENT A
TO RESPONSE TO RFI-C039I

CHARTER'S RFI-C039A-K

Charter

Environmental & Civil Construction | Soil Management

REQUEST FOR INFORMATION

TO:	Steven E. Poirier, PE	RFI NO:	039 A-K
	Geosyntec Consultants	DATE:	15 June 2015
	289 Great Road, Suite 105	CONTRACT NO:	2-1030
	Acton, MA 01720	TITLE:	Sutton Brook Disposal Area
			Tewksbury, MA
	Phone: 978.263.9588	SPEC SECTION:	13020
		DRAWING REF:	
	Email: SPoirier@Geosyntec.com	ATTACHED SKETCH:	

X REQUEST REPLY BY: 6/17/15

____ ITEM ON "CRITICAL PATH" REPLY NEEDED BY: 6/17/15

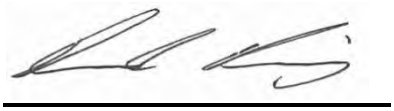
DESCRIPTION OF REQUEST:

Charter has provided a sample location plan, laboratory report, and validation report for confirmatory samples obtained from Debris Piles A, B, C, D, E, F, G and T as well as the Former UST Location, FDDA, GSA1-4 and GSA-5 in the S056 Submittals. Please advise whether this information is sufficient to allow backfill of the Debris Piles and other excavations.

Please review and contact Derek Koenig with comments or questions. Thank you.

COPY TO:

SIGNATURE:



Derek Koenig
Site QC & Health and Safety

REPLY: DATE:

COPY TO:

SIGNATURE:

Name
Title

ATTACHMENT B
TO RESPONSE TO RFI-C039I

GSA-1 THROUGH GSA-4 CONFIRMATORY SAMPLE SUMMARY TABLES

Table 1
Summary of Compounds Detected Above Cleanup Levels
Garage Storage Area (GSA-1 through GSA-4)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA1-B1 7/15/2014	GSA1-E1 7/15/2014	GSA1-N1 7/15/2014	GSA1-S1 7/15/2014	GSA1-W1 7/15/2014	GSA2-B1 7/15/2014	GSA2-B1-FD 7/29/2014	GSA2-E1 7/15/2014	GSA2-N1 7/15/2014	GSA2-S1 7/15/2014	GSA2-W1 7/15/2014
Metals														
	Lead	mg/Kg	65	5.1	7.6	45.2	2.6	22.8 J-	5.2	3.3	5.8	4	3.5	8.5
Semi Volatile Organic Compounds														
	Benzo(a)pyrene	mg/Kg	0.44	<0.18	<0.18	<0.36	<0.18	<0.18	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18
	Di-n-octylphthalate	mg/Kg	0.4	0.05J	0.049J	0.16J	<0.18	0.056J	<0.17	<0.18	0.047J	<0.18	0.048J	<0.18

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA3-B1 7/15/2014	GSA3-E1 7/15/2014	GSA3-E2 9/9/2014	GSA3-N1 7/15/2014	GSA3-S1 7/15/2014	GSA3-W1 7/15/2014	GSA4-B1 7/15/2014	GSA4-E1 7/15/2014	GSA4-N1 7/15/2014	GSA4-S1 7/15/2014	GSA4-W1 7/15/2014
Metals														
	Lead	mg/Kg	65	28.2	**66**	3.4	18.1	2.8	1.9	63.4	56.1	48	40.6	**73.4**
Semi Volatile Organic Compounds														
	Benzo(a)pyrene	mg/Kg	0.44	0.31 J	**0.58 J**	<0.19	0.046J	<0.18	<0.18	**1.1J**	0.1J	0.16J	0.18J	0.31J
	Di-n-octylphthalate	mg/Kg	0.4	0.15J	0.32	<0.19	0.18J	0.082J	<0.18	**0.52J**	0.24	0.1J	0.087J	<1.9

Notes: **Bold** indicates exceedance of GSA cleanup levels (mg/kg).

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

J- = Estimated low value provided (results are likely reported lower than the true value); reference the applicable data validation report and/or laboratory report for more information.

Table 2
Summary of Analytical Results
Garage Storage Area (GSA-1 through GSA-4)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA1-B1 7/15/2014	GSA1-E1 7/15/2014	GSA1-N1 7/15/2014	GSA1-S1 7/15/2014	GSA1-W1 7/15/2014	GSA2-B1 7/15/2014	GSA2-B1-FD 7/29/2014	GSA2-E1 7/15/2014	GSA2-N1 7/15/2014	GSA2-S1 7/15/2014	GSA2-W1 7/15/2014
Metals														
	Lead	mg/Kg	65	5.1	7.6	45.2	2.6	22.8 J-	5.2	3.3	5.8	4	3.5	8.5
	Zinc	mg/Kg	190	11.9	13.2	26.2	9.7	21.3 J-	15.3	11	14.8	9.7	18.6	14.7
Semi Volatile Organic Compounds														
	Benzo(a)anthracene	mg/Kg	4.4	0.029J	0.031J	0.067J	<0.18	0.028J	<0.17	<0.18	0.03J	<0.18	<0.18	<0.18
	Benzo(a)pyrene	mg/Kg	0.44	<0.18	<0.18	<0.36	<0.18	<0.18	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18
	Benzo(b)fluoranthene	mg/Kg	4.4	<0.18	0.01J	0.039J	<0.18	0.0087J	<0.17	<0.18	<0.18	0.005J	<0.18	<0.18
	Benzo(k)fluoranthene	mg/Kg	44	<0.18	<0.18	<0.36	<0.18	<0.18	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18
	Dibenzo(a,h)anthracene	mg/Kg	0.44	<0.18	<0.18	<0.36	<0.18	<0.18	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18
	Di-n-octylphthalate	mg/Kg	0.4	0.05J	0.049J	0.16J	<0.18	0.056J	<0.17	<0.18	0.047J	<0.18	0.048J	<0.18
	Indeno(1,2,3-cd)pyrene	mg/Kg	4.4	<0.18	<0.18	0.19J	<0.18	<0.18	<0.17	<0.18	<0.18	<0.18	<0.18	<0.18

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA3-B1 7/15/2014	GSA3-E1 7/15/2014	GSA3-E2 9/9/2014	GSA3-N1 7/15/2014	GSA3-S1 7/15/2014	GSA3-W1 7/15/2014	GSA4-B1 7/15/2014	GSA4-E1 7/15/2014	GSA4-N1 7/15/2014	GSA4-S1 7/15/2014	GSA4-W1 7/15/2014
Metals														
	Lead	mg/Kg	65	28.2	**66**	3.4	18.1	2.8	1.9	63.4	56.1	48	40.6	**73.4**
Semi Volatile Organic Compounds														
	Benzo(a)anthracene	mg/Kg	4.4	0.33	0.51	<0.19	0.066J	<0.18	<0.18	0.86J	0.12J	0.006J	0.15J	0.32J
	Benzo(a)pyrene	mg/Kg	0.44	0.31 J	**0.58 J**	<0.19	0.046J	<0.18	<0.18	**1.1J**	0.1J	0.16J	0.18J	0.31J
	Benzo(b)fluoranthene	mg/Kg	4.4	0.73 J	1.0 J	<0.19	0.079J	<0.18	<0.18	1.4J	0.2	0.31	0.27	0.48J
	Benzo(k)fluoranthene	mg/Kg	44	0.020 J	0.10 J	<0.19 J	<0.19	<0.18	<0.18	0.49J	0.079J	0.12J	0.079J	0.035J
	Dibenzo(a,h)anthracene	mg/Kg	0.44	<0.18 J	0.10 J	<0.19	<0.19	<0.18	<0.18	<1.9	<0.18	0.021J	<0.19	<1.9
	Di-n-octylphthalate	mg/Kg	0.4	0.15J	0.32	<0.19	0.18J	0.082J	<0.18	**0.52J**	0.24	0.1J	0.087J	<1.9
	Indeno(1,2,3-cd)pyrene	mg/Kg	4.4	0.16 J	0.24 J	<0.19	0.11J	<0.18	<0.18	0.32J	0.037J	0.069J	0.055J	<1.9

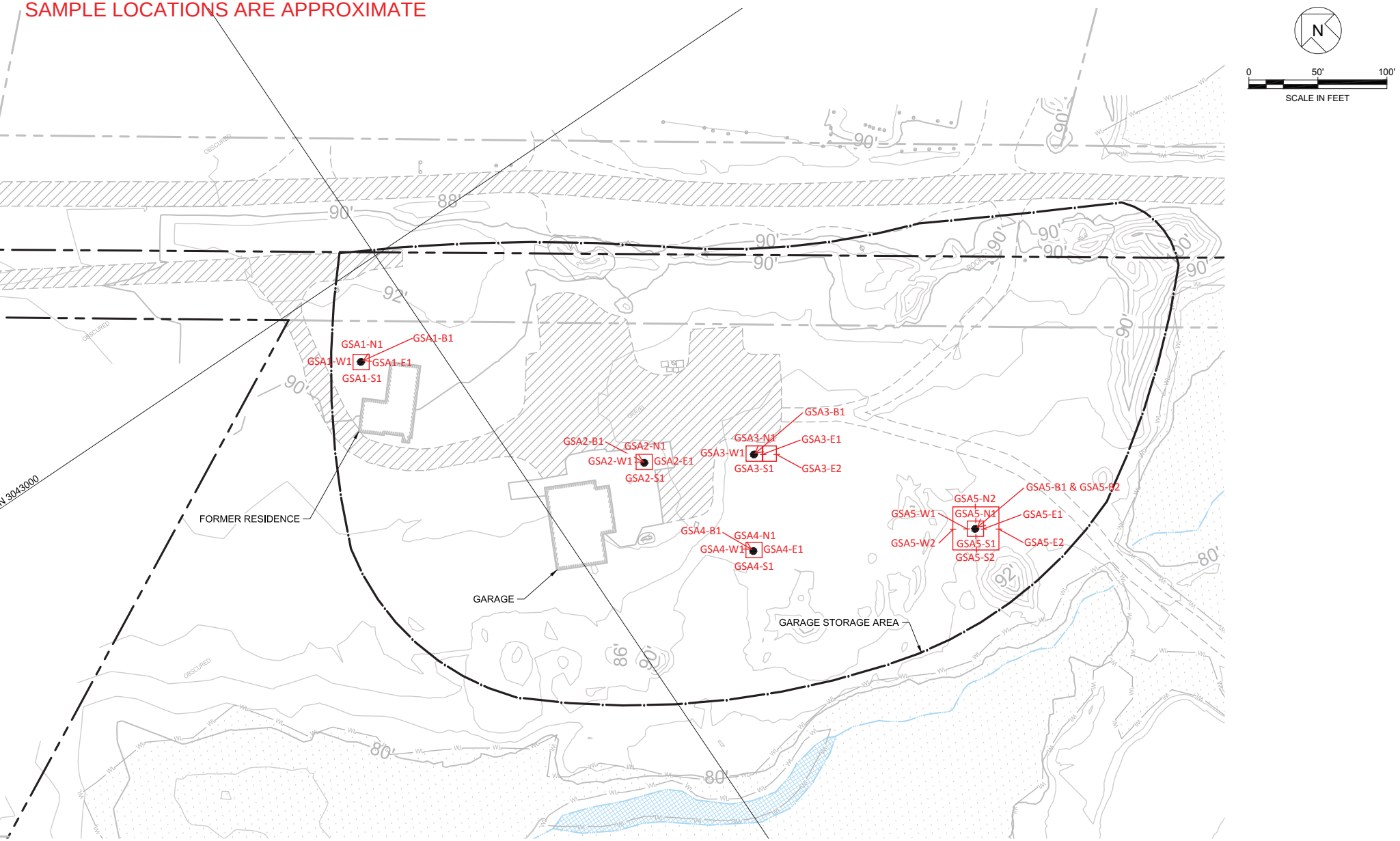
Notes:
Bold indicates exceedance of GSA cleanup levels (mg/kg).
< = less than laboratory reporting limit.
J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.
J- = Estimated low value provided (results are likely reported lower than the true value); reference the applicable data validation report and/or laboratory report for more information.

ATTACHMENT C
TO RESPONSE TO RFI-C039I

GSA-1 THROUGH GSA-4 CONFIRMATORY SAMPLE LOCATIONS

GARAGE STORAGE AREA EXCAVATION / SAMPLE LOCATIONS

SAMPLE LOCATIONS ARE APPROXIMATE



Geosyntec consultants

RESPONSE TO RFI-C039J

PROJECT: Sutton Brook Disposal Area	PROJECT No: BE0158C
LOCATION: Tewksbury, Massachusetts	DATE: 1 October 2015
DESCRIPTION: Remedial Action Construction	CONTRACTOR: Charter Environmental

Reference: RFI-C039A-K, received from Charter, dated 15 June 2015 (Attachment A).
Submittals S056C, S056D, S056E, and S056N dated 16 June 2015, S056L dated 7 June 2015, and S056V dated 14 September 2015.

Response:

Impacted soil in GSA-5, as identified in the design, was excavated and relocated to the Southern Lobe in July 2014. Post-excavation samples were then collected in accordance with Article 3.05G of Specification 13020 (see Attachment C for sample locations). After obtaining and testing confirmatory soil samples, the initial excavation was extended vertically and laterally in November 2014. The excavation was extended vertically to the water table and approximately 10 feet in all lateral directions. Based on sample results, the northern extent of GSA-5 was extended an additional 10-ft in July 2015. Material excavated in November 2014 and July 2015 was relocated to the Northern Lobe.

Analytical data were received from the laboratory and were validated (laboratory reports and data validation reports were provided under separate cover in Submittals S056C, S056D, S056E, S056L, S056N, and S056V). In Attachment B, a summary of compounds that were detected above the GSA Performance Standards in the samples from GSA-5 is presented in Table 1. Table 2 includes a summary of analytical data for all GSA-5 samples.

The residual minor estimated detection of Benzo(a)pyrene above the performance standard (0.57 mg/Kg compared to a performance standard of 0.44 mg/Kg) is not considered to be significant or warrant additional excavation. Based on excavation to the water table (exceedances in the floor samples are at the water table and therefore do not require additional excavation) of the areas identified in the design and the post-excavation sample results, the work in GSA-5 meets remedy requirements and the area is ready for backfill.

Signature:  Date: 1 October 2015

FOR INTERNAL USE ONLY

CHANGE ORDER: Does/Will the Request for Information require a Change Order?

☐YES ☒NO ☐Unknown At This Time

Copy to: Charter, EMI, USEPA, AECOM, MassDEP, R. Doherty

ATTACHMENT A
TO RESPONSE TO RFI-C039J

CHARTER'S RFI-C039A-K

Charter

Environmental & Civil Construction | Soil Management

REQUEST FOR INFORMATION

TO:	Steven E. Poirier, PE	RFI NO:	039 A-K
	Geosyntec Consultants	DATE:	15 June 2015
	289 Great Road, Suite 105	CONTRACT NO:	2-1030
	Acton, MA 01720	TITLE:	Sutton Brook Disposal Area
			Tewksbury, MA
	Phone: 978.263.9588	SPEC SECTION:	13020
		DRAWING REF:	
	Email: SPoirier@Geosyntec.com	ATTACHED SKETCH:	

X REQUEST REPLY BY: 6/17/15

____ ITEM ON "CRITICAL PATH" REPLY NEEDED BY: 6/17/15

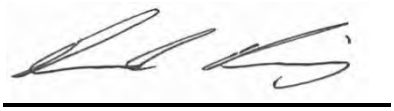
DESCRIPTION OF REQUEST:

Charter has provided a sample location plan, laboratory report, and validation report for confirmatory samples obtained from Debris Piles A, B, C, D, E, F, G and T as well as the Former UST Location, FDDA, GSA1-4 and GSA-5 in the S056 Submittals. Please advise whether this information is sufficient to allow backfill of the Debris Piles and other excavations.

Please review and contact Derek Koenig with comments or questions. Thank you.

COPY TO:

SIGNATURE:



Derek Koenig
Site QC & Health and Safety

REPLY: DATE:

COPY TO:

SIGNATURE:

Name
Title

ATTACHMENT B
TO RESPONSE TO RFI-C039J

GSA-5 CONFIRMATORY SAMPLE SUMMARY TABLES

Table 1
Summary of Compounds Detected Above Cleanup Levels
Garage Storage Area 5 (GSA-5)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	GSA Performance Standard (mg/kg)	GSA5-B1 7/15/2014	GSA5-B1 9/17/2014	GSA5-B1X (Duplicate) 9/17/2014	GSA5-B2 11/11/2014	GSA5-E1 7/15/2014	GSA5-E2 11/11/2014	GSA5-N1 7/15/2014
Metals										
	Lead	mg/Kg	65	**238**	**137 J**	**125**	**230**	**102**	13.9	**132**
	Zinc	mg/Kg	190	**443**	**210 J**	177	**249**	**166**	24.4	**192**
Semi Volatile Organic Compounds										
	Benzo(a)pyrene	mg/Kg	0.44	**2.9**	**0.49**	**0.8**	**0.93**	**0.65J**	0.017	**0.78J**
	Benzo(b)fluoranthene	mg/Kg	4.4	**4.5**	0.63	0.96	1.3	1.3	0.025	1.6

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA5-N2 11/11/2014	GSA5-N3 7/17/2015	GSA5-S1 7/15/2014	GSA5-S2 11/11/2014	GSA5-W1 7/15/2014	GSA5-W2 11/11/2014
Metals									
	Lead	mg/Kg	65	**506**	61.8	**120**	11.3	**159**	20.7
	Zinc	mg/Kg	190	**354**	76.0	182	101	**387**	39.4
Semi Volatile Organic Compounds									
	Benzo(a)pyrene	mg/Kg	0.44	**0.69**	**0.57 J**	**1.9**	<0.015	**1.4**	0.1
	Benzo(b)fluoranthene	mg/Kg	4.4	0.99	0.82	3.1	0.016	1.7	0.13

Notes: **Bold** indicates exceedance of GSA performance standard (mg/kg).

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

Table 2
Summary of Analytical Results
Garage Storage Area 5 (GSA5)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	GSA Performance Standard (mg/kg)	GSA5-B1 7/15/2014	GSA5-B1 9/17/2014	GSA5-B1X (Duplicate) 9/17/2014	GSA5-B2 11/11/2014	GSA5-E1 7/15/2014	GSA5-E2 11/11/2014	GSA5-N1 7/15/2014
Metals										
	Lead	mg/Kg	65	**238**	**137 J**	**125**	**230**	**102**	13.9	**132**
	Zinc	mg/Kg	190	**443**	**210 J**	177	**249**	**166**	24.4	**192**
Semi Volatile Organic Compounds										
	Benzo(a)anthracene	mg/Kg	4.4	3.4	0.50 J	0.88 J	0.98	0.92J	0.017	0.72J
	Benzo(a)pyrene	mg/Kg	0.44	**2.9**	**0.49**	**0.8**	**0.93**	**0.65J**	0.017	**0.78J**
	Benzo(b)fluoranthene	mg/Kg	4.4	**4.5**	0.63	0.96	1.3	1.3	0.025	1.6
	Benzo(k)fluoranthene	mg/Kg	44	0.77J	0.21 J	0.36 J	0.56	0.4J	0.0078	0.092J
	Dibenzo(a,h)anthracene	mg/Kg	0.44	0.12J	0.09	0.13	0.12	0.063J	<0.0073	<0.96
	Di-n-octylphthalate	mg/Kg	0.4	0.041 J	0.054J	<0.17	<0.25	<0.93 J	<0.077	0.024J
	Indeno(1,2,3-cd)pyrene	mg/Kg	4.4	0.76J	0.3	0.41	0.38	0.35J	0.011	0.19J

Method Group	Parameter	Units	GSA Cleanup Levels (mg/kg)	GSA5-N2 11/11/2014	GSA5-N3 7/17/2015	GSA5-S1 7/15/2014	GSA5-S2 11/11/2014	GSA5-W1 7/15/2014	GSA5-W2 11/11/2014
Metals									
	Lead	mg/Kg	65	**506**	61.8	**120**	11.3	**159**	20.7
	Zinc	mg/Kg	190	**354**	76.0	182	101	**387**	39.4
Semi Volatile Organic Compounds									
	Benzo(a)anthracene	mg/Kg	4.4	0.71	0.62	1.7	<0.015	1.3	0.097
	Benzo(a)pyrene	mg/Kg	0.44	**0.69**	**0.57 J**	**1.9**	<0.015	**1.4**	0.1
	Benzo(b)fluoranthene	mg/Kg	4.4	0.99	0.82	3.1	0.016	1.7	0.13
	Benzo(k)fluoranthene	mg/Kg	44	0.34	0.33	0.25J	<0.015	0.53J	0.049
	Dibenzo(a,h)anthracene	mg/Kg	0.44	0.077	0.079	<1	<0.015	0.063J	<0.0083
	Di-n-octylphthalate	mg/Kg	0.4	<0.16	0.010	<1	<0.16	<1.1 J	<0.087
	Indeno(1,2,3-cd)pyrene	mg/Kg	4.4	0.27	0.24 J	0.37J	<0.015	0.48J	0.058

Notes: **Bold** indicates exceedance of GSA performance standard (mg/kg).

< = less than laboratory reporting limit.

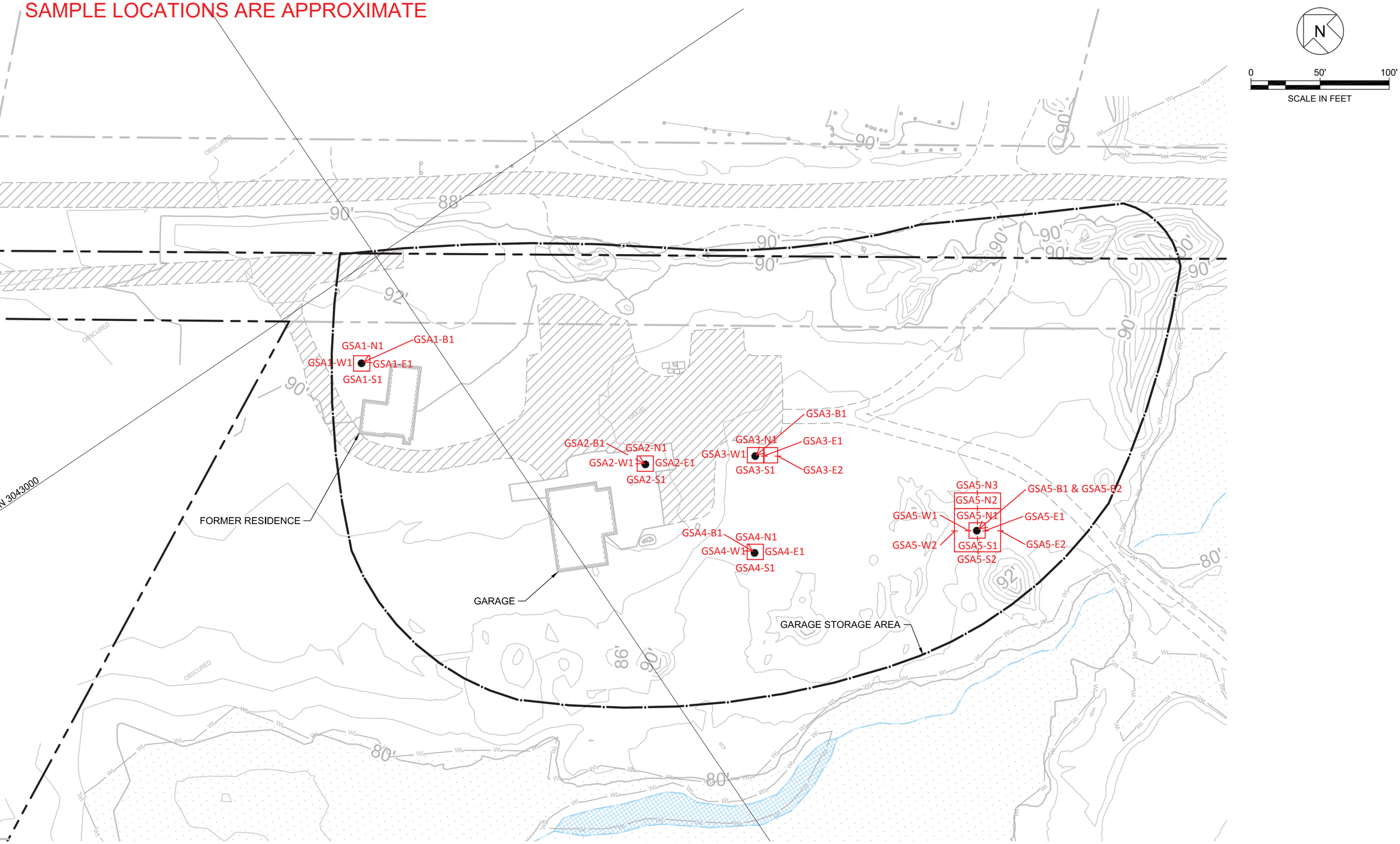
J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

ATTACHMENT C
TO RESPONSE TO RFI-C039J

GSA-5 CONFIRMATORY SAMPLE LOCATIONS

GARAGE STORAGE AREA EXCAVATION / SAMPLE LOCATIONS

SAMPLE LOCATIONS ARE APPROXIMATE



Appendix D.2
FDDA Soil Data

Summary of FDDA Confirmatory Sampling Results

Analyte	Performance Standard[1] (mg/kg)	Basis	Maximum Detection[2] (mg/kg)		
			Shallow Samples (6" below ground surface)	Deep samples (6" above bottom of excavation)	Current SSL; DAF=20[3] (mg/kg)
Bis(2-ethylhexyl)phthalate	28	SSL	13	1.7	28
Di-n-octylphthalate	34	Ecological	4.9	ND	1140
Naphthalene	0.0094	SSL	**0.038**	**0.017**	0.0108
1,1,1-Trichloroethane	1.4	SSL	0.058	0.12	1.4
1,1-Dichloroethane	0.0136	SSL	**0.26**	**0.24**	0.0156
1,2,4-Trimethylbenzene	0.42	SSL	**1.9**	**1.1**	1.62
1,3,5-Trimethylbenzene	2.4	SSL	0.48	0.34	1.74
2-Butanone (methyl ethyl ketone; MEK)	20	SSL	0.0081	0.074	24
Dichloromethane (Methylene Chloride)	0.026	SSL	ND	ND	0.026
Ethylbenzene	15.6	SSL	2	1.5	15.6
4-Methyl-2-pentanone (methyl isobutyl ketone; MIBK)	4.6	SSL	ND	0.17	28
n-Propylbenzene	9.5	Ecological	0.33	0.13	24
Tetrachloroethene	0.046	SSL	ND	ND	0.046
Toluene	13.8	SSL	3.5	3.2	13.8
Xylenes	196	SSL	9.4	6.6	198

Notes

1. Revised performance standards from design (see Appendix C of this five-year review)
   SSL - Soil Screening Level (for evaluation of leachability from soil to groundwater); from Regional Screening Level tables - April 2012 (Dilution attenuation factor [DAF] = 20)
   SSLs are either Maximum Contaminant Level (MCL)-based (1st) or risk-based (2nd).
   Ecological cleanup levels is based on the MATC (the geometric mean of the NOAEL and LOAEL levels) for Robin exposure model in the design.
   LOAEL - Lowest observable adverse effect level
   NOAEL - No observable adverse effect level
2. Data are from Construction Completion Report - Appendix D, RFI-C039H (included in this appendix). Collected in 2014/2015.
   Boldface results exceeded performance standards. However, additional evaluations performed during the remedial action (e.g., SPLP sampling or risk evaluations) were used to justify the limit of excavation. SPLP results for samples showing exceedances were found to be below groundwater performance and/or screening levels.
   ND - Not detected
3. Based on changes in risk exposure parameters and toxicity value changes, SSLs have changed since the time of the design. Presented for evaluation purposes.
   From Regional Screening Level (RSL) tables; November 2018. https://www.epa.gov/risk/regional-screening-levels-rsls

Geosyntec consultants

RESPONSE TO RFI-C039H

PROJECT: Sutton Brook Disposal Area	PROJECT No: BE0158C
LOCATION: Tewksbury, Massachusetts	DATE: 27 October 2015
DESCRIPTION: Remedial Action Construction	CONTRACTOR: Charter Environmental

Reference: RFI-C039A-K, received from Charter, dated 15 June 2015 (Attachment A).

Submittals: S056B, S056M, S056O, and S056Q (dated 16 June 2015); S056S (dated 2 July 2015), and S056V-Rev1 (dated 22 October 2015).

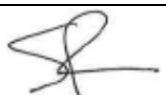
Response:

Impacted soil in the FDDA, as identified in the design, was excavated below the water table and relocated to the Southern Lobe during September and October 2014. Post-excavation samples were then collected in accordance with Article 3.05G of Specification 13020 (see Attachment C for sample locations). After obtaining and testing confirmatory soil samples, the initial excavation was extended laterally in March 2015 near location FDDA-112. The excavation was extended approximately 10 feet eastward and the material was relocated to the Northern Lobe. Additional samples were obtained from the sidewall of the extended excavation and tested. The additional samples were designated with an "A" (e.g., sample FDDA-112 was obtained from the sidewall after the initial location and FDDA-112A was obtained from the sidewall near sample #FDDA-112 after the excavation extension).

In June 2015 additional samples were collected from several locations and analyzed using synthetic precipitation leaching procedure (SPLP) methodology. These additional samples were obtained from FDDA-101 (for naphthalene and 1,2,4-trimethylbenzene), FDDA-112 (for 1,2,4-trimethylbenzene), FDDA-112-6 (for 1,1-dichloroethane and 1,2,4-trimethylbenzene), FDDA-115 (1,2,4-trimethylbenzene), FDDA-115-6 (for naphthalene), FDDA-116 (for naphthalene), FDDA-118 (1,1-dichloroethane) and FDDA-118-6 (1,1-dichloroethane). Due to the J-qualified value of 1,2,4-Trimethylbenzene for sample FDDA-112-6-SPLP obtained 26 June 2015 that was not consistent with other results, a second 1,2,4-trimethylbenzene SPLP sample was collected from location FDDA112A-6 on 6 October 2015 while the laboratory QA/QC controls were evaluated.

Analytical data were received from the laboratory and were validated. Laboratory reports and data validation reports were typically provided under separate cover—see Submittals S056B, S056M, S056O, S056Q, S056S, and S056V-Rev1 and Attachments D and E. In Attachment B, a summary of compounds that were detected above the FDDA Cleanup Levels in the samples from the FDDA is presented in Table 1. Each sidewall sample location has two associated samples. One sample was obtained from approximately 0 to 6 inches below the pre-excavation ground surface and a second sample was obtained from approximately 6 inches above the bottom of the excavation. The samples from 6-inches above the bottom of the excavation are designated with the suffix "6". For example,, FDDA-112 was obtained 0 to 6 inches below the pre-excavation ground surface and FDDA-112-6 was obtained from approximately 6 inches above the bottom of the excavation. Table 2 includes a summary of analytical data for all FDDA samples. The SPLP results are shown in Table 3.

Based on excavation below the seasonal low water table elevation for the areas identified in the design, and the post-excavation sample results, the work in this area meets remedy requirements and the area is ready for backfill. Exceedances in the floor samples are below the water table and therefore do not require additional excavation. Where parameter concentrations were greater than the FDDA cleanup level, SPLP results were less than the Groundwater Performance Standard or USEPA Tapwater Screening Level as summarized in Table 3 or, in the case of FDDA-112A-6, the sample was collected from an elevation below the seasonal low water table (see Attachment F).

Signature:  Date: 27 October 2015

FOR INTERNAL USE ONLY

CHANGE ORDER: Does/Will the Request for Information require a Change Order?

☐YES ☒NO ☐Unknown At This Time

Copy to: Charter, EMI, USEPA, AECOM, MassDEP, R. Doherty

ATTACHMENT A
TO RESPONSE TO RFI-C039H

CHARTER'S RFI-C039A-K

Charter

Environmental & Civil Construction | Soil Management

REQUEST FOR INFORMATION

TO:	Steven E. Poirier, PE	RFI NO:	039 A-K
	Geosyntec Consultants	DATE:	15 June 2015
	289 Great Road, Suite 105	CONTRACT NO:	2-1030
	Acton, MA 01720	TITLE:	Sutton Brook Disposal Area
			Tewksbury, MA
	Phone: 978.263.9588	SPEC SECTION:	13020
		DRAWING REF:	
	Email: SPoirier@Geosyntec.com	ATTACHED SKETCH:	

X REQUEST REPLY BY: 6/17/15

____ ITEM ON "CRITICAL PATH" REPLY NEEDED BY: 6/17/15

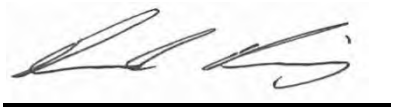
DESCRIPTION OF REQUEST:

Charter has provided a sample location plan, laboratory report, and validation report for confirmatory samples obtained from Debris Piles A, B, C, D, E, F, G and T as well as the Former UST Location, FDDA, GSA1-4 and GSA-5 in the S056 Submittals. Please advise whether this information is sufficient to allow backfill of the Debris Piles and other excavations.

Please review and contact Derek Koenig with comments or questions. Thank you.

COPY TO:

SIGNATURE:



Derek Koenig
Site QC & Health and Safety

REPLY: DATE:

COPY TO:

SIGNATURE:

Name
Title

ATTACHMENT B
TO RESPONSE TO RFI-C039H

FDDA CONFIRMATORY SAMPLE SUMMARY TABLES

Table 1
Summary of Compounds Detected Above Cleanup Levels
Former Drum Disposal Areas (FDDA)
Sutton Brook Disposal Area
Tewksbury, MA

Geosyntec Consultants

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 101 9/27/2014	FDDA 112 9/23/2014	FDDA-112A 3/18/2015	FDDA 112-6 9/23/2014	FDDA-112A-6 3/18/2015	FDAA 115 10/3/2014	FDAA 115-6 10/3/2014	FDAA 115X 10/3/2014	FDDA 116 10/2/2014	FDDA 118 10/1/2014	FDDA 118-6 10/1/2014	FDDA 303 10/1/2014
Semi Volatile Organic Compounds															
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	<0.22	**1000**	<0.30	**2200**	<0.22	0.42	0.11J	5.1	0.35	<0.21	<0.21	0.31
	Di-n-octylphthalate	mg/Kg	34	<0.22	**730**	0.21	**1300**	<0.22	0.11J	<0.2	1.2	<0.2	<0.21	<0.21	0.074J
	Naphthalene	mg/Kg	0.0094	**0.038J**	**6.1J**	<0.21	**11J**	<0.22	0.0064J	**0.017J**	<1.1	**0.012J**	<0.21	<0.21	**0.012J**
Volatile Organic Compounds															
	1,1,1-Trichloroethane	mg/Kg	1.4	<0.0051	**5.8**	<0.25	1.1J	0.12J	<0.0048	<0.0045	<0.005	<0.0051	0.058 J	0.036	0.0021J
	1,1-Dichloroethane	mg/Kg	0.0136	<0.0051	<2.5	<0.25	<1.6	**0.24J**	<0.0048	<0.0045	<0.005	<0.0051	**0.26**	**0.061**	<0.0045
	1,2,4-Trimethylbenzene	mg/Kg	0.42	**0.52**	**360**	**1.5**	**67**	**1.1**	**1.5 J**	0.0041J	**1.9**	0.0038J	0.1	0.054J	0.26
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.1	**170**	0.45	**23**	0.34	0.12 J	0.0003J	0.48	<0.0051	0.036J	0.027J	0.017
	2-Butanone (MEK)	mg/Kg	20	<0.025	<12	<0.99	<8	<1.1	<0.024 J	0.016J	0.0081J	<0.025	<0.36	<0.024	<0.022
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	<0.0051	<2.5	<0.25	<1.6	<0.26	<0.0048	<0.0045	<0.005	<0.0051	<0.071	<0.0048	<0.0045
	Ethyl benzene	mg/Kg	15.6	0.39	**190**	0.83	**23**	1.5	1.2 J	0.00038J	2	0.00072J	1.1	0.28	0.097
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	<0.025	<12	<0.99	<8	0.17J	<0.024	<0.023	<0.025	<0.025	<0.36	<0.024	<0.022
	n-Propylbenzene	mg/Kg	9.5	0.032J	**53**	0.13J	6.4	0.11J	0.082 J	0.035	0.33	0.12	<0.071	0.0057	0.018
	Tetrachloroethene	mg/Kg	0.046	<0.0051	<2.5	<0.25	<1.6	<0.26	<0.0048	<0.0045	<0.005	<0.0051	<0.071	<0.0048	<0.0045
	Toluene	mg/Kg	13.8	0.073	**180**	0.21J	**31**	3.2	<0.0048	<0.0045	0.0065	<0.0051	3.5	<0.0048	<0.058
	Xylenes (unspecified)	mg/Kg	196	1	**610**	4.3	110	6.6	5.5	0.0015J	9.4	0.0011J	4.7	0.39	0.17

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 304 10/3/2014	FDDA 305 9/26/2014	FDDA 307 9/30/2014	FDDA 308 10/1/2014	FDDA 309 9/24/2014	FDDA 310 9/26/2014	FDDA 310X 9/26/2014	FDDA 311 9/26/2014	FDDA 312 9/23/2014	FDDA 314 9/23/2014	FDDA 315 10/14/2014	FDDA 318 10/21/2014
Semi Volatile Organic Compounds															
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	0.033J	0.032J	**52**	0.058J	1.8	13	**30**	0.11J	**42**	**130**	<0.2	**80**
	Di-n-octylphthalate	mg/Kg	34	<0.2	<0.21	16	0.011J	0.68	6.3	13	0.033J	9.9	27	<0.2	**41**
	Naphthalene	mg/Kg	0.0094	**0.014J**	<0.21	<10	<0.21	<0.22	<2.7	<5.3	<0.2	<8.4	**0.59J**	**0.027J**	<15
Volatile Organic Compounds															
	1,1,1-Trichloroethane	mg/Kg	1.4	<0.0059	<0.12	<0.1	0.03	<0.0048	<0.045	<0.69	<0.11	<0.0081	<0.0052	<0.0053	<0.0052
	1,1-Dichloroethane	mg/Kg	0.0136	<0.0059	<0.12	<0.1	**0.26**	0.0043J	<0.045	<0.055	**0.06J**	<0.0081	<0.0052	<0.0053	<0.0052
	1,2,4-Trimethylbenzene	mg/Kg	0.42	**3**	**1.6**	**0.51**	0.28	0.28	**0.82**	31	**1.3**	<0.0081	0.076	**3.7**	0.00086J
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.96	0.39	**8.1**	0.089	0.079	**21**	**11**	0.41	<0.0081	0.034	1.5	0.00053J
	2-Butanone (MEK)	mg/Kg	20	<0.029	0.81	<0.51	0.12	3.6 J	10	**22**	<0.57	<0.041 J	0.027 J	<0.027	<0.021
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	<0.0059	**0.043J**	<0.1	0.022J	0.016J	<0.56	**0.19J**	<0.11	<0.0081	<0.0052	<0.0053	<0.0052
	Ethyl benzene	mg/Kg	15.6	0.91	1.3	8.1	0.34	0.85	1.3	**47**	0.94	0.00088J	0.021	0.00053J	0.13
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	<0.029	3	<0.51	0.18J	**14**	**33**	**74**	<0.57	<0.041	<0.026	<0.027	<0.021
	n-Propylbenzene	mg/Kg	9.5	0.6	0.12	3.7	0.019J	0.035J	**13**	6.5	0.12	<0.0081	0.0032J	0.38J	<0.0052
	Tetrachloroethene	mg/Kg	0.046	<0.0059	<0.12	**0.068J**	0.0023J	0.0019J	<0.56	<0.69	<0.11	<0.0081	<0.0052	<0.0053	<0.0052
	Toluene	mg/Kg	13.8	0.22	8.1	2.8	0.1	6.4	1.7	**69**	0.66	<0.0081	0.0005J	0.00095J	0.0068
	Trichloroethene	mg/Kg	0.036	<0.0059	<0.12	<0.1	0.0034J	0.0016J	<0.56	<0.69	<0.11	<0.0081	<0.0052	<0.0053	<0.0052
	Xylenes (unspecified)	mg/Kg	196	5.1	3.6	0.43	0.98	3	5	1.9	2.8	<0.016	0.15	0.058	0.11

Notes: Bold indicates exceedance of FDDA Cleanup Levels (mg/kg).
< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

"300" series locations indicate samples taken from the bottom of the excavation; "100" series locations indicate two sidewall samples-one taken from 6-inches above the bottom of the excavation and another taken 6-inches below the pre-excavation ground surface.

Table 2
Summary of Analytical Results
Former Drum Disposal Areas (FDDA)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 100 9/29/2014	FDDA 100-6 9/29/2014	FDDA 101 9/27/2014	FDDA 101-6 9/27/2014	FDDA 102 9/24/2014	FDDA 102-6 9/24/2014	FDDA 103 9/23/2014	FDDA 103-6 9/23/2014	FDDA 104 10/7/2014	FDDA 104-6 10/7/2014	FDDA 105 10/8/2014	FDDA 105-6 10/8/2014	FDDA 106 10/9/2014	FDDA 106-6 10/9/2014	FDDA 107 10/15/2014	FDDA 107-6 10/15/2014	FDDA 108 10/20/2014	FDDA 108-6 10/20/2014	FDDA 109 10/20/2014	FDDA 109-6 10/20/2014
Semi Volatile Organic Compounds																							
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	0.15J	1.7	<0.22	0.099J	13	0.54	1.1	0.088J	<0.2	<0.2	<0.2	0.43	0.97	0.81	0.33	0.056J	<0.2	<0.21	0.032J	<0.21
	Di-n-octylphthalate	mg/Kg	34	0.097J	1	<0.22	0.035J	4.9	0.28	0.13J	<0.19	<0.2	<0.2	0.015J	0.035J	0.14J	0.2J	0.12J	<0.2	<0.2	<0.21	<0.23	<0.21
	Naphthalene	mg/Kg	0.0094	<0.22	<0.23	**0.038J**	<0.2	<2.1	<0.21	<0.2	<0.19	0.0056J	<0.2	<0.2	<0.21	<0.29	<0.43	<0.22	<0.2	<0.2	<0.21	<0.23	<0.21
Volatile Organic Compounds																							
	1,1,1-Trichloroethane	mg/Kg	1.4	<0.0048	<0.0049	<0.0051	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	<0.006	<0.0056	<0.012	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	1,1-Dichloroethane	mg/Kg	0.0136	<0.0048	<0.0049	<0.0051	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	<0.006	<0.0056	<0.012	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	1,2,4-Trimethylbenzene	mg/Kg	0.42	0.15	0.17	**0.52**	0.0048J	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	0.0099	0.0088	<0.0056	0.0041J	0.0035J	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.0021J	0.0053	0.1	0.00076J	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	0.0015J	0.0016J	<0.0056	0.00094J	0.0013J	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	2-Butanone (MEK)	mg/Kg	20	<0.024	<0.025	<0.025	<0.029	<0.024	<0.024 J	<0.026 J	<0.021 J	<0.031	<0.025	0.015 J	<0.028	0.044J	0.074J	<0.031 J	<0.023	<0.023	<0.021	0.0042J	0.0027J
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	<0.0048	<0.0049	<0.0051	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	<0.006	<0.0056	<0.012	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	Ethyl benzene	mg/Kg	15.6	0.54	0.82	0.39	0.00062J	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	0.0013J	<0.0056	0.034	0.043	<0.0062	0.00071J	<0.0057	<0.0053	<0.0065	<0.0068
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	<0.024	<0.025	<0.025	<0.029	<0.024	0.0022J	<0.026	<0.021	<0.031	<0.025	<0.03	<0.028	<0.061	<0.079	<0.031	<0.023	<0.023	<0.021	<0.026	<0.027
	n-Propylbenzene	mg/Kg	9.5	0.026J	0.024J	0.032J	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	0.001J	0.0079	<0.0056	0.0013J	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	Tetrachloroethene	mg/Kg	0.046	<0.0048	<0.0049	<0.0051	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	<0.006	<0.0056	<0.012	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	Toluene	mg/Kg	13.8	<0.0048	<0.0049	0.073	<0.0057	<0.0049	0.00089J	<0.0052	<0.0041	<0.0061	0.00081J	<0.006	<0.0056	0.043	0.072	<0.0062	<0.0046	<0.0057	0.00048J	0.00077J	<0.0068
	Trichloroethene	mg/Kg	0.036	<0.0048	<0.0049	<0.0051	<0.0057	<0.0049	<0.0047	<0.0052	<0.0041	<0.0061	<0.0051	<0.006	<0.0056	<0.012	<0.016	<0.0062	<0.0046	<0.0057	<0.0053	<0.0065	<0.0068
	Xylenes (unspecified)	mg/Kg	196	0.045J	0.12J	1	0.0022J	<0.0098	<0.0094	<0.01	<0.0083	<0.012	<0.01	0.0028J	<0.011	0.0079J	0.0099J	<0.012	0.0026J	<0.011	<0.011	<0.013	<0.014

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 110 10/21/2014	FDDA 110-6 10/21/2014	FDDA 111 10/21/2014	FDDA 111-6 10/21/2014	FDDA 112 9/23/2014	FDDA-112A 3/18/2015	FDDA 112-6 9/23/2014	FDDA-112A-6 3/18/2015	FDDA 113 10/2/2014	FDDA 113-6 10/2/2014	FDDA 114 10/2/2014	FDDA 114-6 10/2/2014	FDAA 115 10/3/2014	FDAA 115-6 10/3/2014	FDAA 115X 10/3/2014	FDDA 116 10/2/2014	FDDA 116-6 10/2/2014	FDDA 117 10/2/2014	FDDA 117-6 10/2/2014	FDDA 118 10/1/2014
Semi Volatile Organic Compounds																							
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	<0.26	<0.24	<0.21	<0.2	**1000**	<0.30	**2200**	<0.22	<0.21	<0.21	0.06J	0.03J	0.42	0.11J	5.1	0.35	0.031J	0.088J	<0.21	<0.21
	Di-n-octylphthalate	mg/Kg	34	<0.26	<0.24	<0.21	<0.2	**730**	0.21	**1300**	<0.22	<0.21	<0.21	<0.2	<0.2	0.11J	<0.2	1.2	<0.2	<0.2	<0.2	<0.21	<0.21
	Naphthalene	mg/Kg	0.0094	<0.26	<0.24	<0.21	<0.2	**6.1J**	<0.21	**11J**	<0.22	<0.21	<0.21	<0.2	<0.2	0.0064J	**0.017J**	<1.1	**0.012J**	<0.2	<0.2	<0.21	<0.21
Volatile Organic Compounds																							
	1,1,1-Trichloroethane	mg/Kg	1.4	<0.0081	<0.0068	<0.0069	<0.0056	**5.8**	<0.25	1.1J	0.12J	<0.0051	<0.0048	<0.0046	<0.0055	<0.0048	<0.0045	<0.005	<0.0051	<0.0043	<0.0055	<0.0049	0.058 J
	1,1-Dichloroethane	mg/Kg	0.0136	<0.0081	<0.0068	<0.0069	<0.0056	<2.5	<0.25	<1.6	**0.24J**	<0.0051	0.0015J	<0.0046	<0.0055	<0.0048	<0.0045	<0.005	<0.0051	<0.0043	<0.0055	<0.0049	**0.26**
	1,2,4-Trimethylbenzene	mg/Kg	0.42	0.0081R	<0.0068	<0.0069	<0.0056	**360**	**1.5**	**67**	**1.1**	0.0062	0.011	<0.0046	0.38	**1.5 J**	0.0041J	**1.9**	0.0038J	0.002J	<0.0055	<0.0049	0.1
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.0081R	<0.0068	<0.0069	<0.0056	**170**	0.45	**23**	0.34	0.0025J	0.0048	<0.0046	0.061	0.12 J	0.0003J	0.48	<0.0051	<0.0043	<0.0055	<0.0049	0.036J
	2-Butanone (MEK)	mg/Kg	20	<0.033	0.0068J	0.003J	0.0016J	<12	<0.99	<8	<1.1	<0.026	<0.024	0.013J	0.0087J	<0.024 J	0.016J	0.0081J	<0.025	0.0074J	<0.028	<0.025	<0.36
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	<0.0081	<0.0068	<0.0069	<0.0056	<2.5	<0.25	<1.6	<0.26	<0.0051	<0.0048	<0.0046	<0.0055	<0.0048	<0.0045	<0.005	<0.0051	<0.0043	<0.0055	<0.0049	<0.071
	Ethyl benzene	mg/Kg	15.6	<0.0081	<0.0068	<0.0069	<0.0056	**190**	0.83	**23**	1.5	0.02	0.03	<0.0046	0.14	1.2 J	0.00038J	2	0.00072J	0.0049	0.0013J	<0.0049	1.1
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	<0.033	<0.027	<0.028	<0.022	<12	<0.99	<8	0.17J	<0.026	<0.024	<0.023	<0.027	<0.024	<0.023	<0.025	<0.025	<0.022	<0.028	<0.025	<0.36
	n-Propylbenzene	mg/Kg	9.5	0.0081R	<0.0068	<0.0069	<0.0056	**53**	0.13J	6.4	0.11J	0.0062	0.0094	<0.0046	0.069	0.082 J	0.035	0.33	0.12	0.13	<0.0055	<0.0049	<0.071
	Tetrachloroethene	mg/Kg	0.046	<0.0081	<0.0068	<0.0069	<0.0056	<2.5	<0.25	<1.6	<0.26	<0.0051	<0.0048	<0.0046	<0.0055	<0.0048	<0.0045	<0.005	<0.0051	<0.0043	<0.0055	<0.0049	<0.071
	Toluene	mg/Kg	13.8	0.00065J	0.00078J	0.001J	0.00079J	**180**	0.21J	**31**	3.2	<0.0051	<0.0048	<0.0046	<0.0055	<0.0048	<0.0045	0.0065	<0.0051	<0.0043	<0.0055	<0.0049	3.5
	Trichloroethene	mg/Kg	0.036	<0.0081	<0.0068	<0.0069	<0.0056	<2.5	<0.25	<1.6	0.016J	<0.0051	<0.0048	<0.0046	<0.0055	<0.0048	<0.0045	<0.005	<0.0051	<0.0043	<0.0055	<0.0049	<0.071
	Xylenes (unspecified)	mg/Kg	196	<0.016	<0.014	<0.014	<0.011	**610**	4.3	110	6.6	0.0094J	0.016	<0.0092	0.29	5.5	0.0015J	9.4	0.0011J	0.0011J	0.0053J	<0.0099	4.7

Notes: Bold indicates exceedance of FDDA Cleanup Levels (mg/kg).

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

R = Rejected due to a serious deficiency with the associated quality control result(s). The presence or absense of the analyte cannot be confirmed.

300 series locations indicate samples taken from the bottom of the excavation; "100" series locations indicate two sidewall samples-one taken from 6-inches above the bottom of the excavation and another taken 6-inches below the pre-excavation ground surface.

Table 2
Summary of Analytical Results
Former Drum Disposal Areas (FDDA)
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 118-6 10/1/2014	FDDA 119 9/29/2014	FDDA 119-6 9/29/2014	FDDA 120 10/6/2014	FDDA 120-6 10/6/2014	FDDA 121 10/6/2014	FDDA 121-6 10/6/2014	FDDA 122 10/6/2014	FDDA 122-6 10/6/2014	FDDA 123 10/6/2014	FDDA 123-6 10/6/2014	FDDA 300 10/2/2014	FDDA 300X 10/2/2014	FDDA 301 9/29/2014	FDDA 302 9/30/2014	FDDA 303 10/1/2014	FDDA 304 10/3/2014	FDDA 305 9/26/2014	FDDA 306 9/27/2014	FDDA 307 9/30/2014
Semi Volatile Organic Compounds																							
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	<0.21	<0.22	<0.23	<0.22	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21	<0.2	0.27	1.5	0.37	0.077J	0.31	0.033J	0.032J	<0.22	**52**
	Di-n-octylphthalate	mg/Kg	34	<0.21	<0.22	<0.23	<0.22	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21	<0.2	0.076J	0.47	0.19J	0.027J	0.074J	<0.2	<0.21	<0.22	16
	Naphthalene	mg/Kg	0.0094	<0.21	<0.22	<0.23	<0.22	<0.22	<0.21	<0.21	<0.21	<0.21	<0.21	<0.2	<0.2	<0.2	<0.22	<0.22	**0.012J**	**0.014J**	<0.21	<0.22	<10
Volatile Organic Compounds																							
	1,1,1-Trichloroethane	mg/Kg	1.4	0.036	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	<0.005	<0.0049	0.0021J	<0.0059	<0.12	<0.0044	<0.1
	1,1-Dichloroethane	mg/Kg	0.0136	**0.061**	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	<0.005	<0.0049	<0.0045	<0.0059	<0.12	<0.0044	<0.1
	1,2,4-Trimethylbenzene	mg/Kg	0.42	0.054J	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	0.069	<0.0049	0.26	**3**	**1.6**	0.034	**0.51**
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.027J	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	0.016	<0.0049	0.017	0.96	0.39	0.0019J	**8.1**
	2-Butanone (MEK)	mg/Kg	20	<0.024	<0.027	<0.027	<0.025	<0.026	<0.024	<0.023	<0.027	<0.024	<0.025	<0.024	<0.025 J	<0.028 J	<0.025	<0.024	<0.022	<0.029	0.81	<0.022	<0.51
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	<0.0048	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	<0.005	<0.0049	<0.0045	<0.0059	**0.043J**	<0.0044	<0.1
	Ethyl benzene	mg/Kg	15.6	0.28	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	0.00097J	<0.0056	0.061	<0.0049	0.097	0.91	1.3	0.0014J	8.1
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	<0.024	<0.027	<0.027	<0.025	<0.026	<0.024	<0.023	<0.027	<0.024	<0.025	<0.024	<0.025	<0.028	<0.025	<0.024	<0.022	<0.029	3	<0.022	<0.51
	n-Propylbenzene	mg/Kg	9.5	0.0057	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	0.0063	<0.0049	0.018	0.6	0.12	0.0039J	3.7
	Tetrachloroethene	mg/Kg	0.046	<0.0048	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	<0.005	<0.0049	<0.0045	<0.0059	<0.12	<0.0044	**0.068J**
	Toluene	mg/Kg	13.8	<0.0048	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	0.024	0.00078J	<0.058	0.22	8.1	<0.0044	2.8
	Trichloroethene	mg/Kg	0.036	<0.0048	<0.0054	<0.0054	<0.0051	<0.0053	<0.0048	<0.0046	<0.0054	<0.0048	<0.005	<0.0049	<0.0049	<0.0056	<0.005	<0.0049	<0.0045	<0.0059	<0.12	<0.0044	<0.1
	Xylenes (unspecified)	mg/Kg	196	0.39	<0.011	<0.011	<0.01	<0.011	<0.0096	<0.0093	<0.011	<0.0097	<0.0099	<0.0098	0.0032J	<0.0110	0.13	<0.0098	0.17	5.1	3.6	0.0047J	0.43

Method Group	Parameter	Units	FDDA Cleanup Levels (mg/kg)	FDDA 308 10/1/2014	FDDA 309 9/24/2014	FDDA 310 9/26/2014	FDDA 310X 9/26/2014	FDDA 311 9/26/2014	FDDA 312 9/23/2014	FDDA 313 9/23/2014	FDDA 314 9/23/2014	FDDA 315 10/14/2014	FDDA 316 10/14/2014	FDDA 316X 10/14/2014	FDDA 317 10/17/2014	FDDA 318 10/21/2014	FDDA 319 10/21/2014	FDDA 320 10/8/2014	FDDA 321 10/10/2014	FDDA 322 10/15/2014	FDDA 323 10/20/2014	FDDA 324 10/6/2014
Semi Volatile Organic Compounds																						
	Bis(2-Ethylhexyl) phthalate	mg/Kg	28	0.058J	1.8	13	**30**	0.11J	**42**	11	**130**	<0.2	<0.21	<0.21	0.03J	**80**	<0.2	<0.2	<0.21	0.075J	<0.21	<0.19
	Di-n-octylphthalate	mg/Kg	34	0.011J	0.68	6.3	13	0.033J	9.9	2.4	27	<0.2	<0.21	<0.21	<0.22	**41**	<0.2	<0.2	<0.21	0.062J	<0.21	<0.19
	Naphthalene	mg/Kg	0.0094	<0.21	<0.22	<2.7	<5.3	<0.2	<8.4	<2.1	**0.59J**	**0.027J**	<0.21	<0.21	<0.22	<15	<0.2	<0.2	<0.21	<0.19	<0.21	<0.19
Volatile Organic Compounds																						
	1,1,1-Trichloroethane	mg/Kg	1.4	0.03	<0.0048	<0.045	<0.69	<0.11	<0.0081	<0.0074	<0.0052	<0.0053	<0.0049	<0.0051	<0.005	<0.0052	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	1,1-Dichloroethane	mg/Kg	0.0136	**0.26**	0.0043J	<0.045	<0.055	**0.06J**	<0.0081	<0.0074	<0.0052	<0.0053	<0.0049	<0.0051	<0.005	<0.0052	<0.0057	<0.0052	0.0013J	<0.0048	<0.0048	<0.0053
	1,2,4-Trimethylbenzene	mg/Kg	0.42	0.28	0.28	**0.82**	31	**1.3**	<0.0081	0.0023J	0.076	**3.7**	<0.0049	<0.0051	<0.0071	0.00086J	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	1,3,5-Trimethylbenzene	mg/Kg	2.4	0.089	0.079	**21**	**11**	0.41	<0.0081	<0.0074	0.034	1.5	<0.0049	<0.0051	<0.005	0.00053J	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	2-Butanone (MEK)	mg/Kg	20	0.12	3.6 J	10	**22**	<0.57	<0.041 J	<0.048	0.027 J	<0.027	<0.025 J	<0.025	<0.025	<0.021	<0.023	<0.026	<0.025	<0.024 J	<0.019	<0.026
	Dichloromethane (Methylene chloride)	mg/Kg	0.026	0.022J	0.016J	<0.56	**0.19J**	<0.11	<0.0081	<0.0074	<0.0052	<0.0053	<0.0049	<0.0051	<0.005	<0.0052	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Ethyl benzene	mg/Kg	15.6	0.34	0.85	1.3	**47**	0.94	0.00088J	<0.0074	0.021	0.00053J	<0.0049	<0.0051	<0.005	0.13	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	4.6	0.18J	**14**	**33**	**74**	<0.57	<0.041	<0.037	<0.026	<0.027	<0.025	<0.025	<0.025	<0.021	<0.023	<0.026	<0.025	<0.024	<0.019	<0.026
	n-Propylbenzene	mg/Kg	9.5	0.019J	0.035J	**13**	6.5	0.12	<0.0081	<0.0074	0.0032J	0.38J	<0.0049	<0.0051	0.00099J	<0.0052	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Tetrachloroethene	mg/Kg	0.046	0.0023J	0.0019J	<0.56	<0.69	<0.11	<0.0081	<0.0074	<0.0052	<0.0053	<0.0049	<0.0051	<0.005	<0.0052	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Toluene	mg/Kg	13.8	0.1	6.4	1.7	**69**	0.66	<0.0081	<0.0074	0.0005J	0.00095J	<0.0049	<0.0051	<0.005	0.0068	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Trichloroethene	mg/Kg	0.036	0.0034J	0.0016J	<0.56	<0.69	<0.11	<0.0081	<0.0074	<0.0052	<0.0053	<0.0049	<0.0051	<0.005	<0.0052	<0.0057	<0.0052	<0.005	<0.0048	<0.0048	<0.0053
	Xylenes (unspecified)	mg/Kg	196	0.98	3	5	1.9	2.8	<0.016	<0.015	0.15	0.058	<0.0099	<0.01	0.0019J	0.11	<0.011	<0.01	<0.0099	<0.0097	<0.0096	<0.011

Notes:

Bold indicates exceedance of FDDA Cleanup Levels (mg/kg).

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

R = Rejected due to a serious deficiency with the associated quality control result(s). The presence or absense of the analyte cannot be confirmed.

300 series locations indicate samples taken from the bottom of the excavation; "100" series locations indicate two sidewall samples-one taken from 6-inches above the bottom of the excavation and another taken 6-inches below the pre-excavation ground surface.

Table 3
Summary of SPLP Results
FDDA
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standard	USEPA Tapwater Screening Level	FDDA-101 SPLP-6/26/2015	FDDA-112 SPLP-6/26/2015	FDDA-112-6 SPLP-6/26/2015	FDDA-112-6 SPLP-10/6/2015	FDDA-115 SPLP-6/26/2015	FDDA-115-6 SPLP-6/26/2015	FDDA-116 SPLP-6/26/2015	FDDA-118 SPLP-6/26/2015	FDDA-118-6 SPLP-6/26/2015
Semi Volatile Organic Compound													
	Naphthalene	µg/L	100		<50	--	--	--	--	<50	<50	--	--
Volatile Organic Compounds													
	1,1-Dichloroethane	µg/L	360		--	--	0.34J	--	--	--	--	<1	<1
	1,2,4-Trimethylbenzene	µg/L		15	<1	<1	140J	<1	0.94J	--	--	--	--

Notes:

< = less than laboratory reporting limit.

-- = not analyzed

J = Compound detected below method quantitation limit, estimated value provided.

Groundwater Performance Standards are taken from Table 3.2 Target Constituents and Performance Standards - Groundwater of the project QAPP.

USEPA Tapwater Screening Levels are taken from the US EPA's Regional Screenign Levels with target cancer risk (TR) of 1E-06 and target hazard quotients (THQ) of 1.0, dated May 2014.

ATTACHMENT C
TO RESPONSE TO RFI-C039H

FDDA CONFIRMATORY SAMPLE LOCATIONS

FDDA SAMPLE LOCATIONS
- THE EXTENTS OF THE RE-EXCAVATION PERFORMED AT LOCATION 112 ARE APPROXIMATE.
- ALL 100 SERIES SIDEWALL SAMPLES SHOWN ON THIS MAP ALSO HAVE A -6 SAMPLE ASSOCIATED WITH THEM TO ACCOUNT FOR THE REQUIRED SAMPLE FROM 6" ABOVE THE EXCAVATION FLOOR.

120 121 324 123 122

SAMPLE LOCATIONS
112A AND 112A-6

ROCKS

CONFIRMATION SAMPLING PLAN

SAMPLE LOCATIONS MAY BE ADJUSTED BY THE SUPERVISING CONTRACTOR BASED ON FIELD CONDITIONS. A MINIMUM OF 24 FLOOR AND 40 SIDEWALL SAMPLES SHALL BE TAKEN (NOTE 1).

ATTACHMENT D
TO RESPONSE TO RFI-C039H

LABORATORY REPORT J56218

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

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TestAmerica Job ID: 240-56218-1
Client Project/Site: Sutton Brook Disposal Site

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Attn: Mr. Derek Koenig

Authorized for release by:
10/14/2015 4:58:09 PM

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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: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

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: 240-56218-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Charter Environmental, Inc.

Project: Sutton Brook Disposal Site

Report Number: 240-56218-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 10/7/2015 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

The trip blank sample was archived since water VOCs were not requested on the Chain of Custody (COC).

VOLATILE ORGANIC COMPOUNDS

Sample FDDA 112A-6 SPLP (240-56218-1) was analyzed for volatile organic compounds in accordance with SW846 Method 8260C. The sample was leached on 10/07/2015 and analyzed on 10/09/2015.

The percent difference for the surrogate bromofluorobenzene was below the CCV acceptance criteria. The recovery for this surrogate was in control for all samples, and QC associated to this CCV, so no corrective was needed, and the results have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-56218-1	FDDA 112A-6 SPLP	Solid	10/06/15 09:00	10/07/15 09:30

Detection Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Client Sample ID: FDDA 112A-6 SPLP **Lab Sample ID: 240-56218-1**

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Client Sample ID: FDDA 112A-6 SPLP
Date Collected: 10/06/15 09:00
Date Received: 10/07/15 09:30

Lab Sample ID: 240-56218-1
Matrix: Solid

Method: 8260C - Volatile Organic Compounds by GC/MS - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		1.0	0.41	ug/L			10/09/15 16:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*94*		*80 - 120*		*10/09/15 16:56*	*1*
Dibromofluoromethane (Surr)	*96*		*79 - 120*		*10/09/15 16:56*	*1*
4-Bromofluorobenzene (Surr)	*86*		*61 - 120*		*10/09/15 16:56*	*1*
1,2-Dichloroethane-d4 (Surr)	*92*		*78 - 125*		*10/09/15 16:56*	*1*

Surrogate Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DBFM	BFB	12DCE
Lab Sample ID	Client Sample ID	(80-120)	(79-120)	(61-120)	(78-125)
LCS 240-201216/6	Lab Control Sample	98	97	87	101

Surrogate Legend

TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: SPLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DBFM	BFB	12DCE
Lab Sample ID	Client Sample ID	(80-120)	(79-120)	(61-120)	(78-125)
240-56218-1	FDDA 112A-6 SPLP	94	96	86	92
LB 240-200913/1-A MB	Method Blank	91	95	79	94

Surrogate Legend

TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: LCS 240-201216/6
Matrix: Solid
Analysis Batch: 201216

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethane	20.0	19.7		ug/L		98	79 - 125
1,2,4-Trimethylbenzene	20.0	18.7		ug/L		93	76 - 120
1,3,5-Trimethylbenzene	20.0	19.1		ug/L		96	77 - 120
Benzene	20.0	19.6		ug/L		98	80 - 120
Ethylbenzene	20.0	19.2		ug/L		96	80 - 120
o-Xylene	20.0	19.0		ug/L		95	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*97*		*79 - 120*
4-Bromofluorobenzene (Surr)	*87*		*61 - 120*
1,2-Dichloroethane-d4 (Surr)	*101*		*78 - 125*

Lab Sample ID: LB 240-200913/1-A MB
Matrix: Solid
Analysis Batch: 201216

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	ND		1.0	0.41	ug/L			10/09/15 16:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*91*		*80 - 120*		*10/09/15 16:33*	*1*
Dibromofluoromethane (Surr)	*95*		*79 - 120*		*10/09/15 16:33*	*1*
4-Bromofluorobenzene (Surr)	*79*		*61 - 120*		*10/09/15 16:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*78 - 125*		*10/09/15 16:33*	*1*

QC Association Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

GC/MS VOA

Leach Batch: 200913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-56218-1	FDDA 112A-6 SPLP	SPLP	Solid	1312	
LB 240-200913/1-A MB	Method Blank	SPLP	Solid	1312	

Analysis Batch: 201216

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-56218-1	FDDA 112A-6 SPLP	SPLP	Solid	8260C	200913
LB 240-200913/1-A MB	Method Blank	SPLP	Solid	8260C	200913
LCS 240-201216/6	Lab Control Sample	Total/NA	Solid	8260C	

Lab Chronicle

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Client Sample ID: FDDA 112A-6 SPLP
Date Collected: 10/06/15 09:00
Date Received: 10/07/15 09:30

Lab Sample ID: 240-56218-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			200913	10/07/15 17:20	DRJ	TAL CAN
SPLP	Analysis	8260C		1	201216	10/09/15 16:56	TJL1	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Certification Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

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	04-30-17
Connecticut	State Program	1	PH-0590	12-31-15
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-26-16
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	07-31-16
New Jersey	NELAP	2	OH001	10-30-15 *
New York	NELAP	2	10975	03-31-16
Ohio VAP	State Program	5	CL0024	10-31-15 *
Oregon	NELAP	10	4062	02-23-16
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-16
West Virginia DEP	State Program	3	210	12-31-15
Wisconsin	State Program	5	999518190	08-31-16

Laboratory: TestAmerica Buffalo

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	State Program	9	1169CA	09-30-17
Connecticut	State Program	1	PH-0568	09-30-16
Florida	NELAP	4	E87672	06-30-16
Georgia	State Program	4	N/A	03-31-16
Georgia	State Program	4	956	03-31-16
Illinois	NELAP	5	200003	09-30-16
Iowa	State Program	7	374	03-01-17
Kansas	NELAP	7	E-10187	11-30-15 *
Kentucky (DW)	State Program	4	90029	12-31-15 *
Kentucky (UST)	State Program	4	30	03-31-16
Kentucky (WW)	State Program	4	90029	12-31-15 *
Louisiana	NELAP	6	02031	06-30-16
Maine	State Program	1	NY00044	12-04-16
Maryland	State Program	3	294	03-31-16
Massachusetts	State Program	1	M-NY044	06-30-16
Michigan	State Program	5	9937	03-31-16
Minnesota	NELAP	5	036-999-337	12-31-15 *
New Hampshire	NELAP	1	2973	09-11-16
New Jersey	NELAP	2	NY455	09-30-15 *
New York	NELAP	2	10026	03-31-16
North Dakota	State Program	8	R-176	03-31-16
Oklahoma	State Program	6	9421	08-31-16
Oregon	NELAP	10	NY200003	06-09-16
Pennsylvania	NELAP	3	68-00281	07-31-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-56218-1

Laboratory: TestAmerica Buffalo (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
Rhode Island	State Program	1	LAO00328	12-30-15 *
Tennessee	State Program	4	TN02970	03-31-16
Texas	NELAP	6	T104704412-15-6	07-31-16
USDA	Federal		P330-11-00386	11-26-17
Virginia	NELAP	3	460185	09-14-16
Washington	State Program	10	C784	02-10-16
West Virginia DEP	State Program	3	252	09-30-15 *
Wisconsin	State Program	5	998310390	08-31-16

* Certification renewal pending - certification considered valid.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS



240-56218 Chain of Custody

4101 Shuffel Street, N.W. North Canton, OH 44720 **tel** 330.497.9396 **fax** 330.497.0772 **www.testamericainc.com**

24109

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: DEREK KOENIG	Lab PM: JOHN MCFADDEN	Carrier Tracking No(s):	COC No:
Client Contact: Mr. Derek Koenig	Phone: 857-207-0504	E-Mail: John.McFadden@testamericainc.com		Page: 1 OF 1
Company: CHARTER ENVIRONMENTAL				Job #:
Address: 500 HARRISON AVE, SUITE 4R	Due Date Requested: ASAP			
City: BOSTON	TAT Requested (days): 5 DAY TAT			
State, Zip: MA, 02118				
Phone: 857-246-6800	PO #: Purchase Order not required			
Email: DKOENIG@CHARTER.US	WO #:			
Project Name: Sutton Brook Disposal Site	Project #: 48009679			
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)	8260C - TCL list	6010C, 7471B, 8081B, 8082A, 8270D	1,2,4-Trimethylbenzene SPLP	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	X	X	
FODA 12A-6 SPLP	10/6/15	0900	G	Solid	N				X		NO SDG
TRIP BLANK	—	—	—	—							TRIP BLANK

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: ANALYSIS IS 1,2,4 TRIMETHYLBENZENE

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10/6/15 1525	CHARTER		10/6/15 1530	TA
2	Relinquished by:	Date/Time: 10/6/15 1600	Company TA	Received by:	Date/Time: 10/6/15 930	Company 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:

10/14/2015

TestAmerica Canton Sample Receipt Form/Narrative Login # : 56218
Canton Facility

Client Charter Site Name _____ Cooler unpacked by:

Cooler Received on 10-6-15 Opened on 10-6-15

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 +1.0 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C~~

~~IR GUN# 4 (CF +0.5 °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 -1.5 °C) Observed Cooler Temp. 2.4 °C Corrected Cooler Temp. 0.9 °C

☐ See Multiple Cooler Form

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) or bottle kits (LLHg/MeHg)? 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 person(s) who collected the samples 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# HC554612
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): _____

ATTACHMENT E
TO RESPONSE TO RFI-C039H

DATA VALIDATION REPORT FOR LABORATORY REPORT J56218

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 15 October 2015

To: Steven Poirier

From: Mary Tyler

CC: J. Caprio

Subject: Stage 2B Data Validation - Level IV Data Deliverable – Synthetic Precipitation Leaching Procedure (SPLP) 1,2,4-Trimethylbenzene by EPA Methods 1312/8260C - TestAmerica Job Number 240-56218-1

SITE: Sutton Brook Disposal Site

INTRODUCTION

This report summarizes the findings of the Stage 2B data validation of one solid sample, collected on October 6, 2015, as part of the Sutton Brook Disposal Site sampling event. The analyses were performed at TestAmerica Laboratories, Inc., North Canton, Ohio (TestAmerica North Canton). The sample was analyzed for the following test:

- **EPA Methods 1312/8260C-SPLP 1,2,4-Trimethylbenzene**

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2B data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives per the specified analytical requirements for the project.

The organic data were reviewed based on the following:

- Quality Assurance Project Plan for Remedial Action (hereafter referred to as the QAPP), Revision 6, Sutton Brook Disposal Area Tewksbury, MA, Project Number BE0158, May 2014, including revised Table 3-8;

- Environmental Monitoring Plan (hereafter referred to as the EMP), Revision 2, Sutton Brook Disposal Site, Tewksbury, MA, Volume II, August 2011, including addenda dated March 26, 2012 and August 21, 2012;

- EPA Region 1, EPW-New England Data Validation Functional Guidelines for Evaluating Environmental Analysis, Revised December 1996;

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01);

- The pertinent methods referenced by the data package and professional judgment.

The following sample was analyzed and validated at a Stage 2B level:

Laboratory ID	Client ID
240-56218-1	FDDA 112A-6 SPLP

The sample was received at the laboratory outside 4±2°C; the temperature at receipt was 0.9°C. Based on professional and technical judgment, no qualifications were applied to the data.

A trip blank was listed on the chain of custody (COC), but no collection dates, times or analyses were listed. Per the narrative, a trip blank was received, but was archived and not analyzed.

1.0 VOLATILE ORGANIC COMPOUNDS

One solid sample was analyzed for SPLP 1,2,4-trimethylbenzene per EPA Methods 1312/8260C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Time
✓ Instrument Performance Check
✓ Initial Calibration
✓ Initial and Continuing Calibration Verification
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample

- ✓ Surrogate
- ✓ Equipment Blank
- ✓ Trip Blank
- ✓ Internal Standard
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The SPLP 1,2,4-trimethylbenzene data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

1.1.1 Analytical Anomalies

The QAPP indicated volatile organic compound (VOC) analyses by EPA Method 8260B and the COC lists 1,2,4-trimethylbenzene SPLP; the laboratory analyzed the sample using EPA Methods 1312/8260C.

1.2 Holding Time

The holding times for a solid sample are 14 days from collection to SPLP extraction, then 14 days from SPLP extraction to analysis. The holding times were met for the sample analyses.

1.3 Instrument Performance Check

An instrument performance check sample (tune standard) was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. The ion abundance criteria were met for bromofluorobenzene (BFB).

1.4 Initial Calibration

An appropriate initial calibration was performed for 1,2,4-trimethylbenzene. The laboratory calculated the percent relative standard deviation (%RSD) of the relative response factors (RRFs). The %RSD was within the method (20% RSD) and validation criteria for 1,2,4-trimethylbenzene. The target analyte RRFs were above the method and validation minimum RRF criteria.

1.5 Initial and Continuing Calibration Verification (ICV and CCV)

For 1,2,4-trimethylbenzene, the ICV and CCV were performed at the required frequency. The 1,2,4-trimethylbenzene RRFs were above the validation minimum RRF criteria. The percent differences (%Ds) between the RRFs in the initial calibration and the ICV or CCV were within the method and validation acceptance criteria.

It was noted that the %D for surrogate 4-bromofluorobenzene in the CCV was high, 21%D, with a low bias, slightly outside the method specified 20%D criteria. Since the %D for 1,2,4-trimethylbenzene and the other three surrogates were within the method specified acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.

1.6 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 201216). 1,2,4-Trimethylbenzene was not detected in the method blank above the MDL.

1.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

1.8 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result for the LCS was within the laboratory specified acceptance criteria.

1.9 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

1.10 Equipment Blank

An equipment blank was not submitted.

1.11 Trip Blank

A trip blank accompanied the sample shipment, but was not analyzed.

1.12 Internal Standard

The internal standard areas and retention times were within method limits.

1.13 Field Duplicate

A field duplicate sample was not collected.

1.14 Sensitivity

The sample was reported to the MDL. There were no SPLP RLs and MDLs listed in revised Table 3-8 of the QAPP.

1.15 Electronic Data Deliverable (EDD) Review

Results and sample ID in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20% as part of the data validation. No discrepancies were identified between the level IV report and the EDD.

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* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference (Inorganic analysis only).

J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference (Inorganic analysis only).

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery or RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

ATTACHMENT F
TO RESPONSE TO RFI-C039H

FDDA EXCAVATION AND THE WATER TABLE ELEVATION

Attachment D
FDDA Excavation and the Water Table Elevation

The 100% Design identified the bottom-of-excavation elevation in the FDDA as the seasonal low water table, further identifying the seasonal low water table elevation as being from 78.8 ft to 77.0 ft (see highlighted design report text below). Table 4 of the 100% Design Report (attached) shows that the lowest measured water table elevation at MW-7S, which is close to location FDDA-112A, was 77.26 ft. Therefore, the anticipated bottom-of-excavation elevation at sample location FDDA-112A was approximately 77 ft. Based on field survey, the actual bottom-of-excavation elevation achieved at FDDA-112A was 72.7 ft. Sample FDDA-112A-6 was collected 6 inches above the bottom of the excavation, or at 73.2 ft., and approximately 4 ft below the seasonal low water table at that location.

100% Design Report Text:

"The vertical extent of excavation will extend to the seasonal low groundwater table elevation that will be established in the field after concurrence with EPA and MassDEP. The lowest recorded groundwater elevations at monitoring wells MW-2S, MW-7S, MW-8M, MW-9, MW-10, MW-12, DEP-1, and WP-9 in and around the FDDA during the RI, the PDI, and the Environmental Monitoring Plan (EMP) activities indicate the groundwater elevation varies slightly across the FDDA area, with higher groundwater elevations toward the east adjacent to the Northern Lobe and lower elevations toward the southwest in the adjacent wetland. A summary of the average, highest, and lowest measured groundwater elevations at these wells is provided in Table 4. The lowest groundwater elevations were recorded during the RI in September 2005 and range from 78.78 feet NAVD88 at MW-2S to 77.03 feet NAVD88 at DEP-1. The average of all groundwater elevations recorded at these wells range from 79.49 feet NAVD88 at MW-2S to 77.71 feet NAVD88 at DEP-1. Therefore, the excavation floor will form a generally planar surface dipping toward the southwest with an approximate elevation of 78.8 feet NAVD88 on the northeastern end and an approximate elevation of 77.0 feet NAVD88 on the southwestern end. To the extent possible, the excavation will be performed at a time when groundwater levels are expected to be seasonally low (which is usually a timeframe from August to November); however, the design excavation depth may not be possible to achieve due to higher groundwater table conditions at the time of excavation."

Table 4
Summary of Groundwater Elevations for Groundwater Monitoring Wells Surrounding FDDA
Sutton Brook Disposal Area Superfund Site - Tewksbury, Massachusetts

Groundwater Monitoring Well ID	Elevation of Top of Casing *(ft amsl)*	Screened Interval *(ft amsl)*	Lowest Measured Water Table Elevation	Average Measured Water Table	Highest Measured Water Table
MW-7S	83.18	73.18 - 83.18	77.26	78.53	79.53
MW-12	28,000	64.02-74.02	78.17	79.49	82.58
DEP-1	81.04	Note 1	77.03	77.71	79.44
MW-9	79.83	54.83 - 64.83	77.39	78.12	78.71
MW-8M	81.02	51.02-61.02	77.52	78.04	78.61
WP-9	80.28	75.78 - 77.78	77.71	77.83	77.98
MW-2B	85.00	48.2 - 62	78.76	79.51	80.07
MW-2S	84.94	69.94-79.94	78.78	79.49	79.97

Notes:

ft amsl - feet above mean sea level

1. The screened interval for DEP-1 is not available.

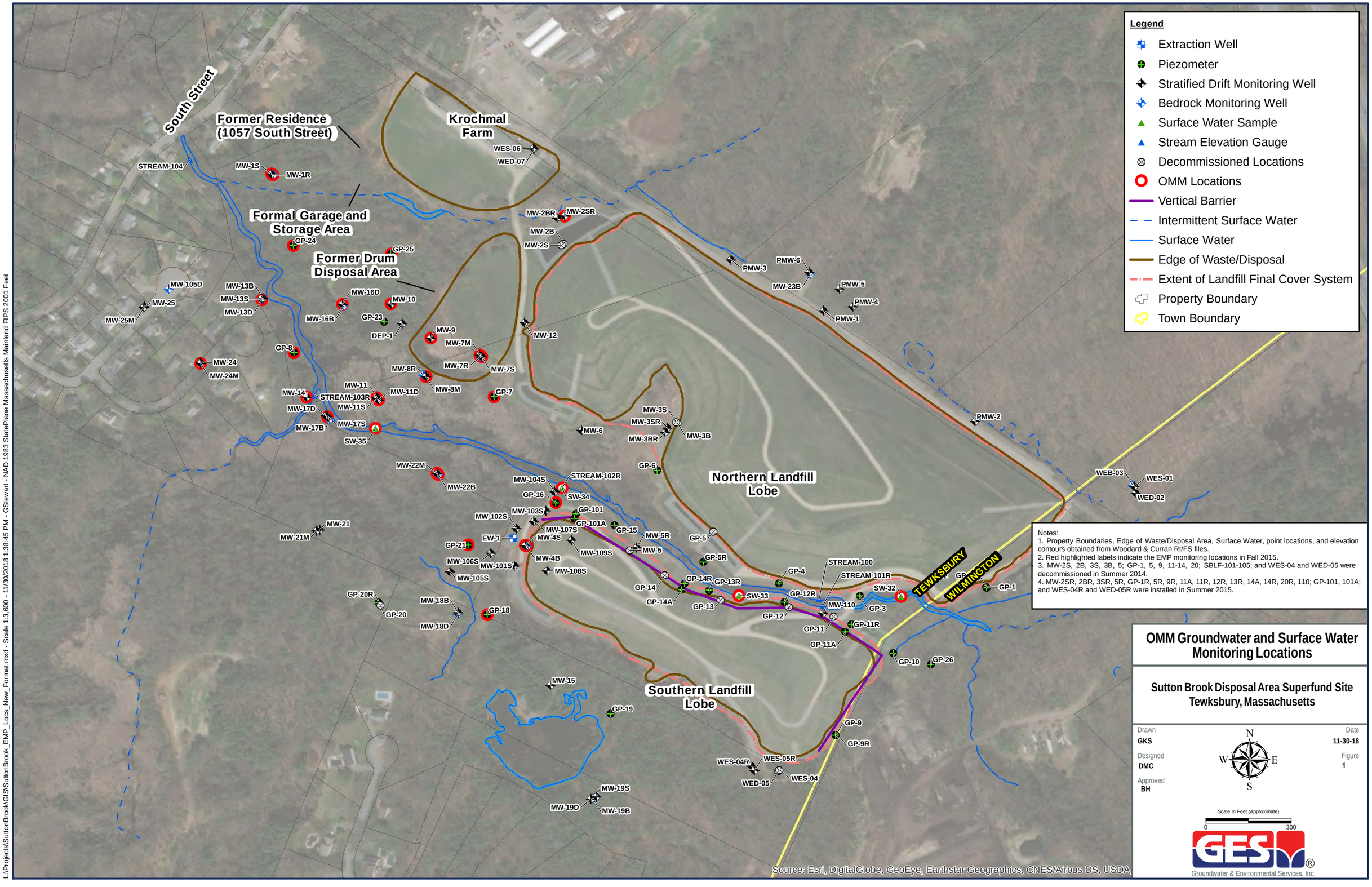
Appendix D.3
Upper Sutton Brook Sediment Data

Summary of Upper Sutton Brook Sediment Sampling

	Performance Standard[1] (mg/kg)	Maximum Detection[2] (mg/kg)		2018 Detections[3] (mg/kg)	
		2015 shallow confirmatory samples	2015 deeper record samples	SW-33	SW-34
2-Methylphenol	0.12	ND	ND	**<0.22**	**<0.22**
3/4-Methylphenol	0.11	ND	**0.98**	**<0.42**	**<0.42**
1,2,4-Trimethylbenzene	5.0	0.44	3.7	ND	ND
1,3,5-Trimethylbenzene	2.5	0.1	0.082	ND	ND
Acetone	0.31	0.013	**1.3**	ND	ND
Carbon disulfide	0.013	0.0051	0.011	ND	ND
Chloroethane	0.19	ND	0.009	ND	ND
Ethylbenzene	1.1	0.14	0.1	ND	ND
4-Methyl-2-pentanone (methyl isobutyl ketone; MIBK)	8.9	ND	1.4	ND	ND
Toluene	0.68	0.039	0.32	ND	ND
Xylenes	1.1	0.56	**1.7**	ND	ND
1,4-Dichlorobenzene	--	NA	NA	ND	0.0028
Tetrahydrofuran	--	NA	NA	0.025	0.025

Notes

1. Revised performance standards from design (see Appendix C of this five-year review); all based on ecological risk.
   Performance standards are the calculated MATC (i.e., the geometric mean of the NOAEL and LOAEL benchmarks).
   -- - No cleanup level
   LOAEL - Lowest observable adverse effect level
   MATC - Maximum acceptable toxicant concnetration
   NOAEL - No observable adverse effect level
2. Data are from Construction Completion Report - Appendix D, RFI-C039L (included in this appendix). Collected in 2015.
   Shallow samples collected within 10 feet upstream and downstream of excavation area. Deeper samples collected 24 inches below water-sediment interface and backfilled over.
   Boldface results exceeded performance standards.
3. Data are from 4th Quarter 2018 OMM Report (Oct 2018-Dec 2018). Collected in 2018.
   Boldface results show that reporting limits exceeded performance standards.
   ND - Not detected
   NA - Not analyzed



Legend

- Extraction Well
- Piezometer
- Stratified Drift Monitoring Well
- Bedrock Monitoring Well
- Surface Water Sample
- Stream Elevation Gauge
- Decommissioned Locations
- OMM Locations
- Vertical Barrier
- Intermittent Surface Water
- Surface Water
- Edge of Waste/Disposal
- Extent of Landfill Final Cover System
- Property Boundary
- Town Boundary

Notes:
1. Property Boundaries, Edge of Waste/Disposal Area, Surface Water, point locations, and elevation contours obtained from Woodard & Curran RI/FS files.
2. Red highlighted labels indicate the EMP monitoring locations in Fall 2015.
3. MW-2S, 2B, 3S, 3B, 5; GP-1, 5, 9, 11-14, 20; SBLF-101-105; and WES-04 and WED-05 were decommissioned in Summer 2014.
4. MW-2SR, 2BR, 3SR, 5R, GP-1R, 5R, 9R, 11A, 11R, 12R, 13R, 14A, 14R, 20R, 110; GP-101, 101A; and WES-04R and WED-05R were installed in Summer 2015.

OMM Groundwater and Surface Water Monitoring Locations

Sutton Brook Disposal Area Superfund Site
Tewksbury, Massachusetts

Drawn: GKS	Date: 11-30-18
Designed: DMC	Figure: 1
Approved: BH	

N W E S

Scale In Feet (Approximate)
0 300

Groundwater & Environmental Services, Inc.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA

L:\Projects\SuttonBrook\GIS\SuttonBrook_EMP_Locs_New_Format.mxd - Scale 1:3,600 - 11/30/2018 1:38:45 PM - GStewart - NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

Table 7
Sediment Sample Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Sample Location ID		SW-33					SW-34					Sediment Performance Standards
Lab ID		SW-33-SO-10082018					SW-34-SO-10082018					
Date		10/8/2018					10/8/2018					
Parameter	**Units**	**Result**	**IQual**	**LQual**	**VQual**	**RL**	**Result**	**IQual**	**LQual**	**VQual**	**RL**	**(ug/kg)**
Volatile Organic Compounds												
1,2-Dichloroethane	ug/kg	< 3.3	UJ-	U F1	UJ-	3.3	< 2.5	U	U		2.5	---
1,2,4-Trimethylbenzene	ug/kg	<3.3		J	U	3.3	<2.5		J	U	2.5	5000
1,3,5-Trimethylbenzene	ug/kg	<3.3		U		3.3	<2.5		J	U	2.5	2500
1,4-Dichlorobenzene	ug/kg	<3.3	J	J	U	3.3	2.8				2.5	---
1,4-Dioxane	ug/kg	<50	J-	F1 J	UJ-	66	<50	J	J	U	50	---
2-Butanone	ug/kg	< 17	UJ-	U F1	UJ-	17	<12	J	J	U	12	---
4-Methyl-2-pentanone	ug/kg	< 17	UJ-	U F1	UJ-	17	< 12	U	U		12	8900
Acetone	ug/kg	< 41	U	B F1	U at 41	41	< 60	U	B	U at 60	60	310
Acrylonitrile	ug/kg	< 17	UJ-	U F1	UJ-	17	< 12	U	U		12	---
Benzene	ug/kg	< 3.3	U	U		3.3	<2.5	J	J	U	2.5	---
Carbon Disulfide	ug/kg	<3.3		U		3.3	<2.5		U		2.5	13
Carbon tetrachloride	ug/kg	< 3.3	UJ-	U F1	UJ-	3.3	< 2.5	U	U		2.5	---
Chloroethane	ug/kg	<3.3		U		3.3	<2.5		U		2.5	190
Ethyl Methacrylate	ug/kg	< 3.3	UJ-	U F1	UJ-	3.3	< 2.5	U	U		2.5	---
Ethylbenzene	ug/kg	< 3.3	U	U		3.3	< 2.5	U	U		2.5	1100
Methylene chloride	ug/kg	< 3.3	U	U		3.3	< 2.5	U	JB	U at RL	2.5	---
n-Propylbenzene	ug/kg	<3.3	J	J	U	3.3	<2.5	J	J	U	2.5	---
Tetrahydrofuran	ug/kg	25	J-	F1	J-	6.6	25				5.0	---
Toluene	ug/kg	< 3.3	U	U		3.3	< 2.5	U	U		2.5	680
Xylenes, Total	ug/kg	< 6.6	U	U		6.6	<5	J	J	U	5.0	1100
Semi-Volatile Organic Compounds												
2-Methylphenol	ug/kg	< 220	U	U		220	< 220	U	U		220	120
3-Methylphenol and 4-Methylphenol	ug/kg	< 420	U	U		420	< 420	U	U		420	110

Notes:
ug/kg = micrograms per kilogram
"---" = No performance standard
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
LQual = Laboratory and/or data validation Qualifier
VQual = Validation Qualifier
MDL = Method Detection Limit
RL = Reporting Limit
U = Compound not detected above reporting limit.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided
F1 = MS and/or MSD Recovery is outside acceptance limits.
J- = Estimated J value with a possible low bias
UJ- = Estimated non-detect with possible low bias
B = compound was found in the blank and sample.
Shading indicated exceedance of Performance Standards (µg/L) and may also signify a reporting limit above a Performance Standard.

Geosyntec consultants

RESPONSE TO RFI-C039L

PROJECT: Sutton Brook Disposal Area	PROJECT No: BE0158C
LOCATION: Tewksbury, Massachusetts	DATE: 24 November 2015
DESCRIPTION: Remedial Action Construction	CONTRACTOR: Charter Environmental

Reference: RFI-C039L, received from Charter, dated 18 November 2015 (Attachment A).

Submittals: S056V-Rev1 (dated 22 October 2015).

Response:

Impacted sediment in Sutton Brook was excavated to a depth of 24-inches below the water-sediment interface and relocated to the Northern Lobe during June and July 2015. Confirmatory samples were collected within 10 feet upstream and downstream of the excavation area and post-excavation samples were collected from the bottom of excavation within the excavation footprint in accordance with Sheet 9 of the April 2014 Construction Drawings and Articles 3.03E through 3.03J of Specification 13020. A plan view (site map) showing the sample locations is provided in Attachment C.

The concentration of acetone for confirmatory sample SBCS-D1 (obtained 19 June 2015) was not consistent with other results. Therefore, two additional samples were collected from the downstream confirmatory sample location and analyzed for acetone on 30 October 2015 while the laboratory QA/QC controls were evaluated.

Analytical data were received from the laboratory and were validated. The laboratory report for the June and July 2015 confirmatory and post-excavation samples (laboratory report #J52117) and the associated data validation report were provided under separate cover (refer to Submittal S056V-Rev1). The laboratory report (laboratory report #J57338) and validation report for the samples obtained on 30 October 2015 are presented in Attachments D and E, respectively. A summary of compounds that were detected above the Sediment Performance Standards from the confirmatory and post-excavation samples is presented in Attachment B, Table 1, and a summary of analytical data for all confirmatory and post-excavation samples is presented in Attachment B, Table 2.

Based on the confirmatory and post-excavation sample results, the brook-excavation work meets remedy requirements and backfill may be placed in the brook.

Signature:  Date: 24 November 2015

FOR INTERNAL USE ONLY

CHANGE ORDER: Does/Will the Request for Information require a Change Order?

☐YES ☒NO ☐Unknown At This Time

Copy to: Charter, EMI, USEPA, AECOM, MassDEP, R. Doherty

ATTACHMENT A
TO RESPONSE TO RFI-C039L

CHARTER'S RFI-C039L

Charter

Environmental & Civil Construction | Soil Management

REQUEST FOR INFORMATION

TO:	Steven E. Poirier, PE	RFI NO:	039 L
	Geosyntec Consultants	DATE:	18 November 2015
	289 Great Road, Suite 105	CONTRACT NO:	2-1030
	Acton, MA 01720	TITLE:	Sutton Brook Disposal Area
			Tewksbury, MA
	Phone: 978.263.9588	SPEC SECTION:	13020
		DRAWING REF:	
	Email: SPoirier@Geosyntec.com	ATTACHED SKETCH:	

_____ REQUEST REPLY BY: _____

X ITEM ON "CRITICAL PATH" REPLY NEEDED BY: 11/18/15

DESCRIPTION OF REQUEST:

Charter has provided a sample location plan and laboratory report for confirmatory samples obtained from upstream and downstream of the Sutton Brook sediment excavation. Please advise whether this information is sufficient to allow backfill of the brook excavation.

Please review and contact Charter with any comments or questions.

COPY TO:

SIGNATURE:

Derek Koenig
Site QC & Health and Safety

Charter

Environmental & Civil Construction | Soil Management

REPLY:	DATE:

COPY TO:

SIGNATURE:

Name
Title

500 Harrison Avenue, Suite 4R | Boston, MA 02118 | 857.246.6800 | www.charter.us

ATTACHMENT B
TO RESPONSE TO RFI-C039L

BROOK CONFIRMATORY SAMPLE SUMMARY TABLES

Table 1
Summary of Compounds Detected Above Performance Standard
Sutton Brook Sediments
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	Sediment Performance Standard (mg/kg)	SBCS-D1-6/19/2015[1]	SBCS-D1-N1-10/30/2015[1]	SBCS-D1-S1-10/30/2015[1]	SB-PE4-7/16/2015[2]	SB-PE5-7/20/2015[2]	SB-PE9-7/25/2015[2]
Semi Volatile Organic Compounds									
	3/4-Methylphenol	mg/Kg	0.11	<8.2	--	--	<0.95	0.034J	**0.98**
Volatile Organic Compounds									
	Acetone	mg/Kg	0.31	**0.87**	0.0093J	0.013J	**0.33**	<1.7	**1.3**
	Xylenes (unspecified)	mg/Kg	1.1	0.16	--	--	0.048	**1.7**	0.24J

Notes:

Bold indicates exceedance of Sediment Performance Standard set forth in Table 3.6 Target Constituents and Performance Standards (mg/kg) - Sediments of the project QAPP.

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

-- = Not tested

1) The average concentration for Acetone for samples SBCS-D1-6/19/2015, SBCS-D1-N1-10/30/2015, and SBCS-D1-N1-10/30/2015 is 0.30 mg/KG (less than the Sediment Performance Standard of 0.31 mg/Kg).

2) Results from post-excavation sample analyses are only to document the concentrations present at the base of the excavation.

Table 2
Summary of Analytical Results
Sutton Brook Sediments
Sutton Brook Disposal Area
Tewksbury, MA

Method Group	Parameter	Units	Sediment Performance Standard (mg/kg)	SBCS-D1-6/19/2015[1]	SBCS-D1-N1-10/30/2015[1]	SBCS-D1-S1-10/30/2015[1]	SBCS-U1-6/17/2015	SB-PE1-7/8/2015[2]	SB-PE1X-7/8/2015[2]	SB-PE2-7/14/2015[2]	SB-PE3-7/15/2015[2]
Semi Volatile Organic Compounds											
	2-Methylphenol	mg/Kg	0.12	<4.2	--	--	<0.33	<0.29	<0.2	<0.22	<0.21
	3/4-Methylphenol	mg/Kg	0.11	<8.2	--	--	<0.64	<0.56	<0.39	<0.42	<0.4
Volatile Organic Compounds											
	1,2,4-Trimethylbenzene	mg/Kg	5.0	0.03	--	--	0.44J	<0.0076	<0.0048	<0.0052	<0.0048
	1,3,5-Trimethylbenzene	mg/Kg	2.5	0.017J	--	--	0.1J	<0.0076	<0.0048	<0.0052	<0.0048
	Acetone	mg/Kg	0.31	**0.87**	0.0093J	0.013J	<2	0.034 J	0.012J	0.039	<0.019
	Carbon disulfide	mg/Kg	0.013	0.0051J	--	--	<0.49	<0.0076	<0.0048	0.002J	0.0017J
	Chloroethane	mg/Kg	0.19	<0.029	--	--	<0.49	0.0017J	0.0011J	0.0013J	<0.0048
	Ethyl benzene	mg/Kg	1.1	0.0051J	--	--	0.14J	<0.0076	<0.0048	<0.0052	<0.0048
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	8.9	<0.12	--	--	<2	<0.03	<0.019	<0.021	<0.019
	Toluene	mg/Kg	0.68	0.039	--	--	<0.49	<0.0076	<0.0048	<0.0052	<0.0048
	Xylenes (unspecified)	mg/Kg	1.1	0.16	--	--	0.56J	0.0016J	0.00069J	<0.01	<0.0096

Method Group	Parameter	Units	Sediment Performance Standard (mg/kg)	SB-PE4-7/16/2015[2]	SB-PE5-7/20/2015[2]	SB-PE6-7/21/2015[2]	SB-PE7-7/23/2015[2]	SB-PE8-7/24/2015[2]	SB-PE9-7/25/2015[2]	SB-PE10-7/28/2015[2]	SB-PE11-7/29/2015[2]
Semi Volatile Organic Compounds											
	2-Methylphenol	mg/Kg	0.12	<0.49	<0.29	<0.21	<0.22	<0.21	<0.22	<0.23	<0.21
	3/4-Methylphenol	mg/Kg	0.11	<0.95	0.034J	<0.41	<0.43	<0.41	**0.98**	<0.44	<0.4
Volatile Organic Compounds											
	1,2,4-Trimethylbenzene	mg/Kg	5.0	0.0029J	3.7	<0.005	<0.0057	0.00073J	<0.26	<0.0053	<0.0048
	1,3,5-Trimethylbenzene	mg/Kg	2.5	<0.015	0.082J	<0.005	<0.0057	0.00051J	<0.26	<0.0053	<0.0048
	Acetone	mg/Kg	0.31	**0.33**	<1.7	0.031	0.018J	<0.031	**1.3**	0.011J	<0.041
	Carbon disulfide	mg/Kg	0.013	0.004J	<0.44	0.011	<0.0057	<0.0046	<0.26	<0.0053	0.00071J
	Chloroethane	mg/Kg	0.19	0.009J	<0.44	0.00092J	0.0005J	0.005	<0.26	<0.0053	<0.0048
	Ethyl benzene	mg/Kg	1.1	<0.015	0.1J	<0.005	<0.0057	<0.0046	0.069J	<0.0053	<0.0048
	Methyl Isobutyl Ketone (MIBK)	mg/Kg	8.9	<0.062	<1.7	<0.02	<0.023	<0.018	1.4	<0.021	<0.019
	Toluene	mg/Kg	0.68	0.0021J	0.079J	<0.005	0.00033J	0.00049J	0.32	<0.0053	<0.0048
	Xylenes (unspecified)	mg/Kg	1.1	0.048	**1.7**	<0.0099	<0.011	0.0053J	0.24J	<0.011	<0.0096

Notes:

Bold indicates exceedance of Sediment Performance Standard set forth in Table 3.5 Target Constituents and Performance Standards (mg/kg) - Sediments of the project QAPP.

< = less than laboratory reporting limit.

J = Estimated value provided; reference the applicable data validation report and/or laboratory report for more information.

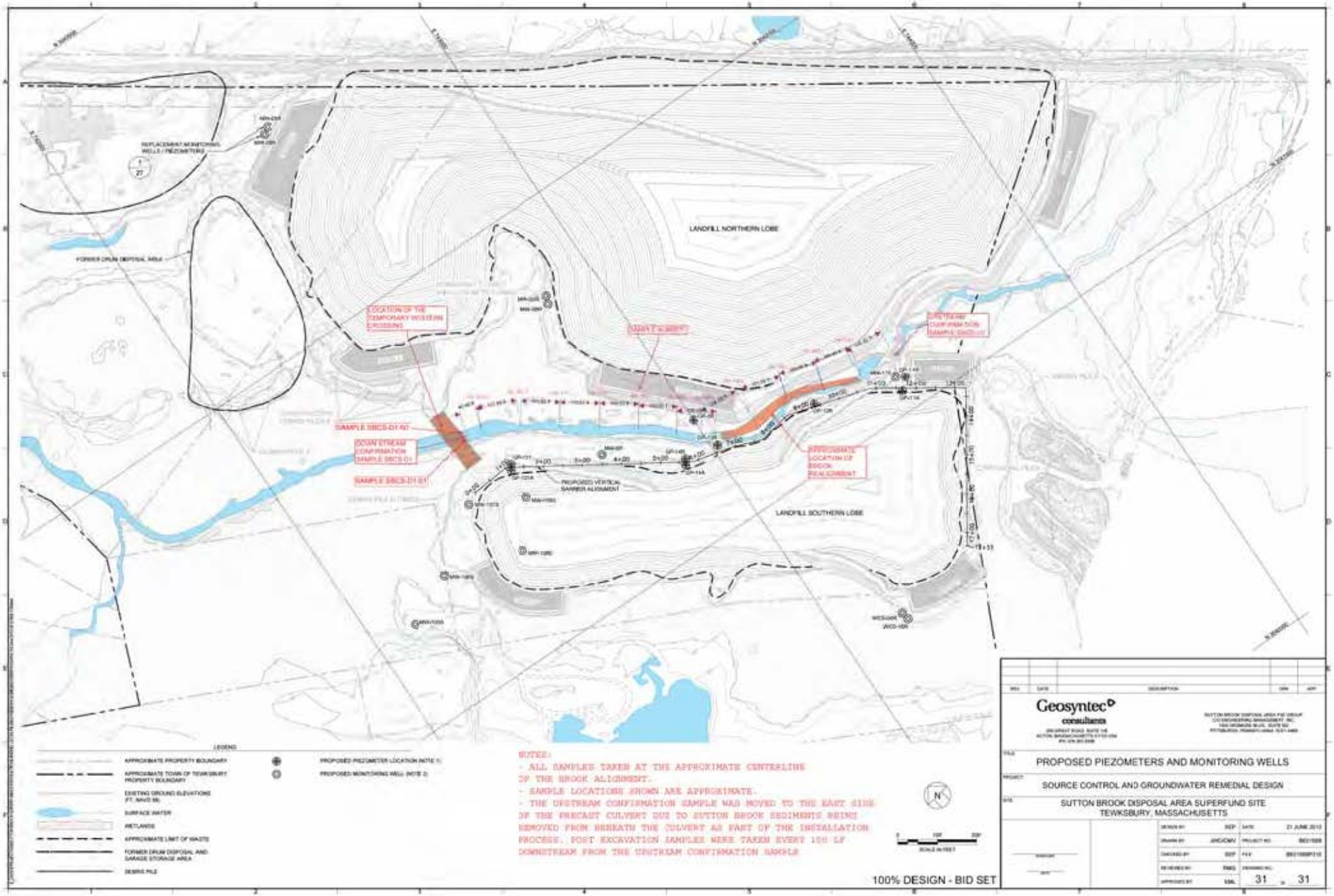
-- = Not tested

1) The average concentration for Acetone for samples SBCS-D1-6/19/2015, SBCS-D1-N1-10/30/2015, and SBCS-D1-N1-10/30/2015 is 0.30 mg/KG (less than the Sediment Performance Standard of 0.31 mg/Kg).

2) Results from post-excavation sample analyses are only to document the concentrations present at the base of the excavation.

ATTACHMENT C
TO RESPONSE TO RFI-C039L

BROOK CONFIRMATORY SAMPLE LOCATIONS



NOTES:
- ALL SAMPLES TAKEN AT THE APPROXIMATE CENTERLINE OF THE BROOK ALIGNMENT.
- SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.
- THE UPSTREAM CONFIRMATION SAMPLE WAS MOVED TO THE EAST SIDE OF THE PRECAST CULVERT DUE TO SUTTON BROOK SEDIMENTS BEING REMOVED FROM BENEATH THE CULVERT AS PART OF THE INSTALLATION PROCESS. POST EXCAVATION SAMPLES WERE TAKEN EVERY 100 LF DOWNSTREAM FROM THE UPSTREAM CONFIRMATION SAMPLE

100% DESIGN - BID SET

Geosyntec consultants

SUTTON BROOK DISPOSAL AREA PRP GROUP
C/O ENGINEERING MANAGEMENT, INC.

PROPOSED PIEZOMETERS AND MONITORING WELLS

SOURCE CONTROL AND GROUNDWATER REMEDIAL DESIGN

SUTTON BROOK DISPOSAL AREA SUPERFUND SITE
TEWKSBURY, MASSACHUSETTS

DESIGN BY	SEP	DATE	21 JUNE 2013
DRAWN BY	JWC/DMV	PROJECT NO.	SE01558
CHECKED BY	SEP	FILE	SE01558P210
REVIEWED BY	RMG	DRAWING NO.	
APPROVED BY	SML	31	31

ATTACHMENT D
TO RESPONSE TO RFI-C039L

LABORATORY REPORT J57338

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: 240-57338-1
Client Project/Site: Sutton Brook Disposal Site

For:
Charter Environmental, Inc.
500 Harrison Ave
Suite 404R
Boston, Massachusetts 02118

Attn: Mr. Derek Koenig

Authorized for release by:
11/3/2015 3:36:57 PM

John McFadden, Project Manager I
(330)497-9396
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Links

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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 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: 240-57338-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Charter Environmental, Inc.

Project: Sutton Brook Disposal Site

Report Number: 240-57338-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 10/31/2015 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples SBCS-D1-S1 (240-57338-1), SBCS-D1-N1 (240-57338-2) and TRIP BLANK (240-57338-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were prepared on 10/31/2015 and analyzed on 11/02/2015.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 240-204802 and analytical batch 240-204773 on these samples: SBCS-D1-S1 (240-57338-1), SBCS-D1-N1 (240-57338-2) and TRIP BLANK (240-57338-3) .

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples SBCS-D1-S1 (240-57338-1) and SBCS-D1-N1 (240-57338-2) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 11/02/2015.

Job ID: 240-57338-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL CAN
Moisture	Percent Moisture	EPA	TAL CAN

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 CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-57338-1	SBCS-D1-S1	Solid	10/30/15 13:00	10/31/15 09:45
240-57338-2	SBCS-D1-N1	Solid	10/30/15 13:10	10/31/15 09:45
240-57338-3	TRIP BLANK	Solid	10/30/15 00:00	10/31/15 09:45

Detection Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Client Sample ID: SBCS-D1-S1 — Lab Sample ID: 240-57338-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.013	J	0.018	0.0053	mg/Kg	1		8260C	Total/NA

Client Sample ID: SBCS-D1-N1 — Lab Sample ID: 240-57338-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	0.0093	J	0.019	0.0053	mg/Kg	1		8260C	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-57338-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Client Sample ID: SBCS-D1-S1
Date Collected: 10/30/15 13:00
Date Received: 10/31/15 09:45

Lab Sample ID: 240-57338-1
Matrix: Solid
Percent Solids: 79.3

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.013	J	0.018	0.0053	mg/Kg		10/31/15 15:55	11/02/15 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*72*		*58 - 123*	*10/31/15 15:55*	*11/02/15 17:26*	*1*
4-Bromofluorobenzene (Surr)	*94*		*52 - 136*	*10/31/15 15:55*	*11/02/15 17:26*	*1*
Toluene-d8 (Surr)	*92*		*67 - 125*	*10/31/15 15:55*	*11/02/15 17:26*	*1*
Dibromofluoromethane (Surr)	*88*		*37 - 132*	*10/31/15 15:55*	*11/02/15 17:26*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	79		0.10	0.10	%			11/02/15 15:39	1
Percent Moisture	21		0.10	0.10	%			11/02/15 15:39	1

Client Sample ID: SBCS-D1-N1
Date Collected: 10/30/15 13:10
Date Received: 10/31/15 09:45

Lab Sample ID: 240-57338-2
Matrix: Solid
Percent Solids: 79.1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.0093	J	0.019	0.0053	mg/Kg		10/31/15 15:55	11/02/15 17:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*71*		*58 - 123*	*10/31/15 15:55*	*11/02/15 17:51*	*1*
4-Bromofluorobenzene (Surr)	*93*		*52 - 136*	*10/31/15 15:55*	*11/02/15 17:51*	*1*
Toluene-d8 (Surr)	*93*		*67 - 125*	*10/31/15 15:55*	*11/02/15 17:51*	*1*
Dibromofluoromethane (Surr)	*91*		*37 - 132*	*10/31/15 15:55*	*11/02/15 17:51*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	79		0.10	0.10	%			11/02/15 15:39	1
Percent Moisture	21		0.10	0.10	%			11/02/15 15:39	1

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Client Sample ID: TRIP BLANK
Date Collected: 10/30/15 00:00
Date Received: 10/31/15 09:45

Lab Sample ID: 240-57338-3
Matrix: Solid

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		0.020	0.0057	mg/Kg		10/31/15 15:55	11/02/15 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*58 - 123*	*10/31/15 15:55*	*11/02/15 18:17*	*1*
4-Bromofluorobenzene (Surr)	*92*		*52 - 136*	*10/31/15 15:55*	*11/02/15 18:17*	*1*
Toluene-d8 (Surr)	*93*		*67 - 125*	*10/31/15 15:55*	*11/02/15 18:17*	*1*
Dibromofluoromethane (Surr)	*95*		*37 - 132*	*10/31/15 15:55*	*11/02/15 18:17*	*1*

Surrogate Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	12DCE (58-123)	BFB (52-136)	TOL (67-125)	DBFM (37-132)
240-57338-1	SBCS-D1-S1	72	94	92	88
240-57338-2	SBCS-D1-N1	71	93	93	91
240-57338-3	TRIP BLANK	77	92	93	95
LCS 240-204773/5	Lab Control Sample	71	90	94	93
MB 240-204773/6	Method Blank	74	93	94	92

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-204773/6
Matrix: Solid
Analysis Batch: 204773

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		0.020	0.0057	mg/Kg			11/02/15 11:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*58 - 123*		*11/02/15 11:52*	*1*
4-Bromofluorobenzene (Surr)	*93*		*52 - 136*		*11/02/15 11:52*	*1*
Toluene-d8 (Surr)	*94*		*67 - 125*		*11/02/15 11:52*	*1*
Dibromofluoromethane (Surr)	*92*		*37 - 132*		*11/02/15 11:52*	*1*

Lab Sample ID: LCS 240-204773/5
Matrix: Solid
Analysis Batch: 204773

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	0.0400	0.0431		mg/Kg		108	41 - 137

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*		*58 - 123*
4-Bromofluorobenzene (Surr)	*90*		*52 - 136*
Toluene-d8 (Surr)	*94*		*67 - 125*
Dibromofluoromethane (Surr)	*93*		*37 - 132*

QC Association Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

GC/MS VOA

Analysis Batch: 204773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-57338-1	SBCS-D1-S1	Total/NA	Solid	8260C	204802
240-57338-2	SBCS-D1-N1	Total/NA	Solid	8260C	204802
240-57338-3	TRIP BLANK	Total/NA	Solid	8260C	204802
LCS 240-204773/5	Lab Control Sample	Total/NA	Solid	8260C	
MB 240-204773/6	Method Blank	Total/NA	Solid	8260C	

Prep Batch: 204802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-57338-1	SBCS-D1-S1	Total/NA	Solid	5035	
240-57338-2	SBCS-D1-N1	Total/NA	Solid	5035	
240-57338-3	TRIP BLANK	Total/NA	Solid	5035	

General Chemistry

Analysis Batch: 204863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-57338-1	SBCS-D1-S1	Total/NA	Solid	Moisture	
240-57338-2	SBCS-D1-N1	Total/NA	Solid	Moisture	

Client Sample ID: SBCS-D1-S1 — **Lab Sample ID: 240-57338-1**
Date Collected: 10/30/15 13:00 — **Matrix: Solid**
Date Received: 10/31/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	204863	11/02/15 15:39	JWW	TAL CAN

Client Sample ID: SBCS-D1-S1 — **Lab Sample ID: 240-57338-1**
Date Collected: 10/30/15 13:00 — **Matrix: Solid**
Date Received: 10/31/15 09:45 — **Percent Solids: 79.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			204802	10/31/15 15:55	LAM	TAL CAN
Total/NA	Analysis	8260C		1	204773	11/02/15 17:26	SAM	TAL CAN

Client Sample ID: SBCS-D1-N1 — **Lab Sample ID: 240-57338-2**
Date Collected: 10/30/15 13:10 — **Matrix: Solid**
Date Received: 10/31/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	204863	11/02/15 15:39	JWW	TAL CAN

Client Sample ID: SBCS-D1-N1 — **Lab Sample ID: 240-57338-2**
Date Collected: 10/30/15 13:10 — **Matrix: Solid**
Date Received: 10/31/15 09:45 — **Percent Solids: 79.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			204802	10/31/15 15:55	LAM	TAL CAN
Total/NA	Analysis	8260C		1	204773	11/02/15 17:51	SAM	TAL CAN

Client Sample ID: TRIP BLANK — **Lab Sample ID: 240-57338-3**
Date Collected: 10/30/15 00:00 — **Matrix: Solid**
Date Received: 10/31/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			204802	10/31/15 15:55	LAM	TAL CAN
Total/NA	Analysis	8260C		1	204773	11/02/15 18:17	SAM	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Certification Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

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	04-30-17
Connecticut	State Program	1	PH-0590	12-31-15
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-26-16
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	07-31-16
New Jersey	NELAP	2	OH001	10-30-15 *
New York	NELAP	2	10975	03-31-16
Ohio VAP	State Program	5	CL0024	10-31-15 *
Oregon	NELAP	10	4062	02-23-16
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-16
West Virginia DEP	State Program	3	210	12-31-15
Wisconsin	State Program	5	999518190	08-31-16

Laboratory: TestAmerica Buffalo

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	State Program	9	1169CA	09-30-17
Connecticut	State Program	1	PH-0568	09-30-16
Florida	NELAP	4	E87672	06-30-16
Georgia	State Program	4	N/A	03-31-16
Georgia	State Program	4	956	03-31-16
Illinois	NELAP	5	200003	09-30-16
Iowa	State Program	7	374	03-01-17
Kansas	NELAP	7	E-10187	01-31-16
Kentucky (DW)	State Program	4	90029	12-31-15 *
Kentucky (UST)	State Program	4	30	03-31-16
Kentucky (WW)	State Program	4	90029	12-31-15 *
Louisiana	NELAP	6	02031	06-30-16
Maine	State Program	1	NY00044	12-04-16
Maryland	State Program	3	294	03-31-16
Massachusetts	State Program	1	M-NY044	06-30-16
Michigan	State Program	5	9937	03-31-16
Minnesota	NELAP	5	036-999-337	12-31-15 *
New Hampshire	NELAP	1	2973	09-11-16
New Jersey	NELAP	2	NY455	06-30-16
New York	NELAP	2	10026	03-31-16
North Dakota	State Program	8	R-176	03-31-16
Oklahoma	State Program	6	9421	08-31-16
Oregon	NELAP	10	NY200003	06-09-16
Pennsylvania	NELAP	3	68-00281	07-31-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Charter Environmental, Inc.
Project/Site: Sutton Brook Disposal Site

TestAmerica Job ID: 240-57338-1

Laboratory: TestAmerica Buffalo (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
Rhode Island	State Program	1	LAO00328	12-30-15 *
Tennessee	State Program	4	TN02970	03-31-16
Texas	NELAP	6	T104704412-15-6	07-31-16
USDA	Federal		P330-11-00386	11-26-17
Virginia	NELAP	3	460185	09-14-16
Washington	State Program	10	C784	02-10-16
West Virginia DEP	State Program	3	252	09-30-15 *
Wisconsin	State Program	5	998310390	08-31-16

* Certification renewal pending - certification considered valid.

CHAIN OF CUSTODY
AND
RECEIVING DOCUMENTS



240-57338 Chain of Custody

4101 Shuffel Street, N.W. North Canton, OH 44720 tel 330.497.9396 fax 330.497.0772 www.testamericainc.com

0.3/0.4

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: DEREK KOENIG	Lab PM: JOHN MCFADDEN	Carrier Tracking No(s):	COC No:
Client Contact: Mr. Derek Koenig	Phone: 857-207-0504	E-Mail: John.McFadden@testamericainc.com		Page:
Company: CHARTER ENVIRONMENTAL		Analysis Requested		Job #:
Address: 500 HARRISON AVE, SUITE 4R	Due Date Requested: ASAP			Preservation Codes:
City: BOSTON	TAT Requested (days): 5 DAY TAT			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 - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)
State, Zip: MA, 02118	PO #: Purchase Order not required			
Phone: 857-246-6800	WO #:			
Email: DKOENIG@CHARTER.US	Project #: 48009679			
Project Name: Sutton Brook Disposal Site	SSOW#:			
Site:				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)	8260C - TCL list	6010C, 7471B, 9013B, 9012A, 9056D	VOC's (8260) Acetone Only	Fractionated Organic Carbon D2974	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N						
SBCS-D1-S1	10/30/15	1300	G	Solid					X	X		NO SOG
SBCS-D1-N1	10/30/15	1310	G	S					X	X		NO SOG
TRIP BLANK												TRIP BLANK
360325-Boston												

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: 10/30/15, 1530	Company: CHARTER	Received by:	Date/Time: 10-30-15 1530	Company: TA
Relinquished by:	Date/Time: 10-30-15 12pm	Company	Received by:	Date/Time: 10/31/15 945	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:

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11/3/2015

TestAmerica Canton Sample Receipt Form/Narrative Login # : 57378
Canton Facility

Client Charter Environmental Site Name _____ Cooler unpacked by: Heather Mizen

Cooler Received on 10/31/15 Opened on 10/31/15

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# 53 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN# 48 (CF -0.3 °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 -0.5 °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) or bottle kits (LLHg/MeHg)?	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 person(s) who collected the samples 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# HC554612
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): _____

ATTACHMENT E
TO RESPONSE TO RFI-C039L

DATA VALIDATION REPORTS FOR LABORATORY REPORT J57338

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 9 November 2015

To: Steven Poirier

From: Mary Tyler

CC: J. Caprio

Subject: Stage 2B Data Validation - Level IV Data Deliverable – Acetone by EPA Methods 5035/8260C - TestAmerica Job Number 240-57338-1

SITE: Sutton Brook Disposal Site

INTRODUCTION

This report summarizes the findings of the Stage 2B data validation of two solid samples and one trip blank, collected on October 30, 2015, as part of the Sutton Brook Disposal Site sampling event. The analyses were performed at TestAmerica Laboratories, Inc., North Canton, Ohio (TestAmerica North Canton). The samples were analyzed for the following test:

- **EPA Methods 5035/8260C-Acetone**

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2B data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives per the specified analytical requirements for the project.

The organic data were reviewed based on the following:

- Quality Assurance Project Plan for Remedial Action (hereafter referred to as the QAPP), Revision 6, Sutton Brook Disposal Area Tewksbury, MA, Project Number BE0158, May 2014, including revised Table 3-8;

- Environmental Monitoring Plan (hereafter referred to as the EMP), Revision 2, Sutton Brook Disposal Site, Tewksbury, MA, Volume II, August 2011, including addenda dated March 26, 2012 and August 21, 2012;
- EPA Region 1, EPW-New England Data Validation Functional Guidelines for Evaluating Environmental Analysis, Revised December 1996;
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01);
- The pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed and validated at a Stage 2B level:

Laboratory ID	Client ID
240-57338-1	SBCS-D1-S1
240-57338-2	SBCS-D1-N1

Laboratory ID	Client ID
240-57338-3	TRIP BLANK

The samples were received at the laboratory outside 4±2°C; the temperature at receipt was 0.4°C. Based on professional and technical judgment, no qualifications were applied to the data.

The date and time of collection and the analysis requested were not listed chain of custody (COC) for the trip blank. The laboratory assigned collection date and time of collection of 10/30/15, 9:45 and analyzed the trip blank for acetone.

The method reported was not the method listed in QAPP or on the COC. Information from the laboratory indicated that they used the most recent revision of the method requested.

QAPP Referenced Method and Method Listed on the COC	Laboratory Reported Method
8260B and 8260	8260C

1.0 ACETONE

Two solid samples and one trip blank were analyzed for acetone per EPA Methods 5035/8260C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Time
- ✓ Instrument Performance Check
- ✓ Initial Calibration
- ✓ Initial and Continuing Calibration Verification
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogate
- ✓ Equipment Blank
- ✓ Trip Blank
- ✓ Internal Standard
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

1.1.1 Completeness

The VOC data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

1.1.2 Analytical Anomalies

The QAPP indicated analyses by EPA Method 8260B and the COC lists EPA method 8260; the laboratory analyzed the samples using EPA Method 8260C.

1.2 Holding Time

The holding times for a solid sample are 48 hours from collection to preservation and 14 days from collection to analysis. The holding times were met for the sample analyses.

1.3 Instrument Performance Check

An instrument performance check sample (tune standard) was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. The ion abundance criteria were met for bromofluorobenzene (BFB).

1.4 Initial Calibration

An appropriate initial calibration was performed for acetone. The laboratory used a linear curve fit. The coefficient of determination (r^2) was greater than or equal to 0.990 for the curve fit calibration. The target analyte relative response factors (RRFs) were above the method and validation minimum RRF criteria.

The method recommends the recalculation of the low initial calibration standard when linear curve fits are used to verify the viability of detections at the low end of the calibration curve; the recalculated concentration of the low calibration point should be within ± 30% of the standard's true concentration. The criteria were met.

1.5 Initial and Continuing Calibration Verification (ICV and CCV)

For the target analytes, the ICVs and CCVs were performed at the required frequency. The target analyte RRFs were above the validation minimum RRF criteria. The percent drifts (%Ds) between the true concentrations of the ICV and CCV and the found concentrations for acetone were within the method and validation acceptance criteria.

1.6 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the 8260C data (batch 204773). Acetone was not detected in the method blank above the method detection limit (MDL).

1.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

An MS/MSD pair was not reported due to insufficient sample volume.

1.8 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The result for the LCS was within the laboratory specified acceptance criteria for recovery.

1.9 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

1.10 Equipment Blank

An equipment blank was not collected with the samples.

1.11 Trip Blank

A trip blank, TRIP BLANK, accompanied the sample shipment. Acetone was not detected in the trip blank above the MDL.

1.12 Internal Standard

The internal standard areas and retention times were within method limits.

1.13 Field Duplicate

A field duplicate sample was not collected with the sample set.

1.14 Sensitivity

The samples were reported to the MDL. The acetone reporting limit (RL) and MDL were different from the RL and MDL listed in revised Table 3-8 of the QAPP; there was no performance standard listed in revised Table 3-8 of the QAPP for acetone.

Compound	Laboratory RL (µg/L)	Laboratory MDL (µg/L)	QAPP RL (µg/L)	QAPP MDL (µg/L)
Acetone	0.020	0.0057	0.030	0.0040

µg/L-microgram per liter

1.15 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20% as part of the data validation. No discrepancies were identified between the level IV report and the EDD.

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* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference (Inorganic analysis only).

J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference (Inorganic analysis only).

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

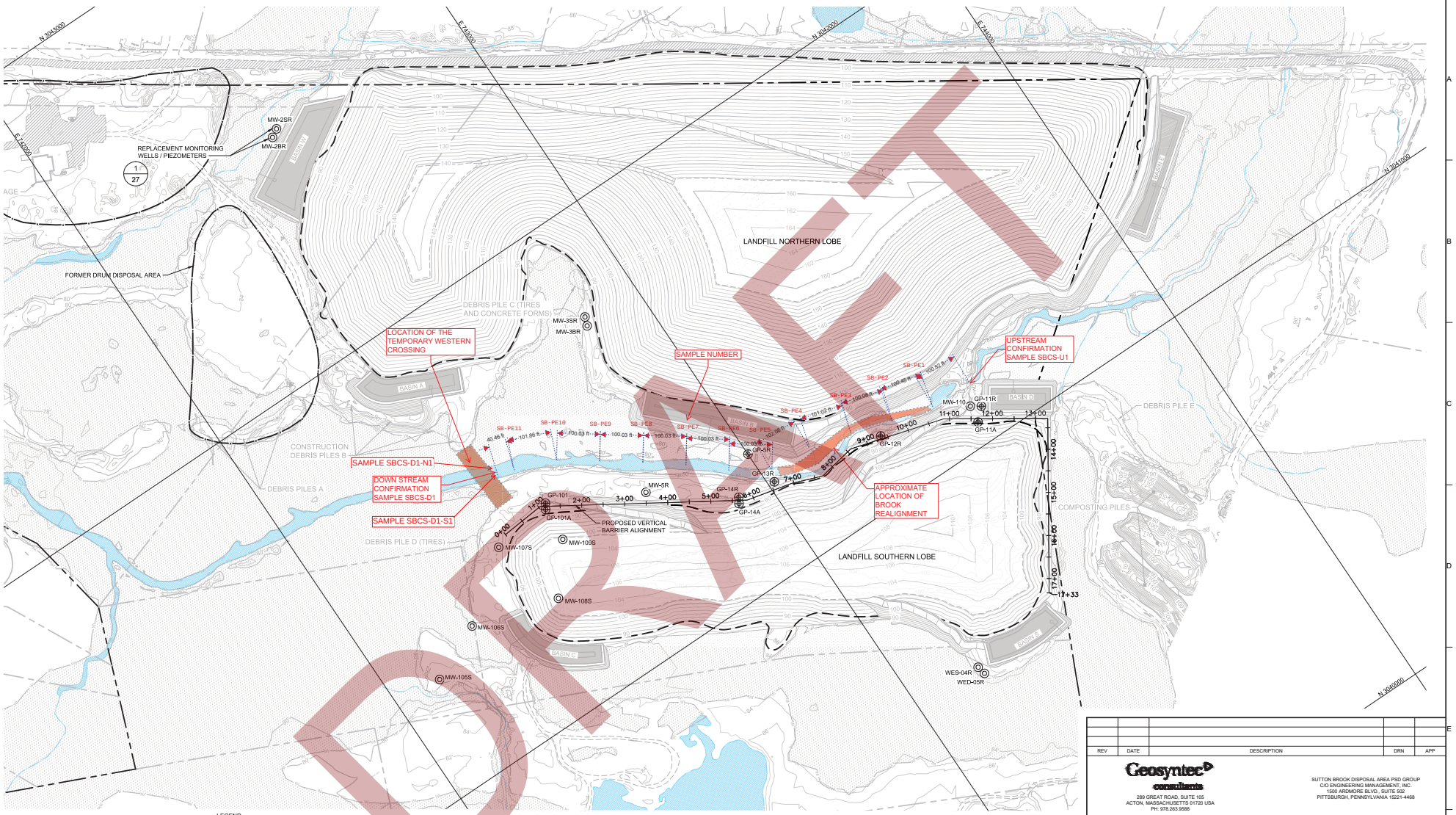
NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery or RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE TOWN OF TEWKSBURY PROPERTY BOUNDARY
- EXISTING GROUND ELEVATIONS (FT, NAVD 88)
- SURFACE WATER
- WETLANDS
- APPROXIMATE LIMIT OF WASTE
- FORMER DRUM DISPOSAL AND GARAGE STORAGE AREA
- DEBRIS PILE
- PROPOSED PIEZOMETER LOCATION (NOTE 1)
- PROPOSED MONITORING WELL (NOTE 2)

NOTES:
- ALL SAMPLES TAKEN AT THE APPROXIMATE CENTERLINE OF THE BROOK ALIGNMENT.
- SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.
- THE UPSTREAM CONFIRMATION SAMPLE WAS MOVED TO THE EAST SIDE OF THE PRECAST CULVERT DUE TO SUTTON BROOK SEDIMENTS BEING REMOVED FROM BENEATH THE CULVERT AS PART OF THE INSTALLATION PROCESS. POST EXCAVATION SAMPLES WERE TAKEN EVERY 100 LF DOWNSTREAM FROM THE UPSTREAM CONFIRMATION SAMPLE

0 100' 200'
SCALE IN FEET

100% DESIGN - BID SET

DRAFT

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
289 GREAT ROAD, SUITE 105
ACTON, MASSACHUSETTS 01720 USA
PH: 978.263.9588

SUTTON BROOK DISPOSAL AREA PSD GROUP
C/O ENGINEERING MANAGEMENT, INC.
1500 ARDMORE BLVD., SUITE 502
PITTSBURGH, PENNSYLVANIA 15221-4468

TITLE: PROPOSED PIEZOMETERS AND MONITORING WELLS

PROJECT: SOURCE CONTROL AND GROUNDWATER REMEDIAL DESIGN

SITE: SUTTON BROOK DISPOSAL AREA SUPERFUND SITE
TEWKSBURY, MASSACHUSETTS

DESIGN BY:	SEP	DATE:	21 JUNE 2013
DRAWN BY:	JWO/CMV	PROJECT NO.:	BE0158B
CHECKED BY:	SEP	FILE:	BE0158BP310
REVIEWED BY:	RMG	DRAWING NO.:	
APPROVED BY:	SML		31 OF 31

SIGNATURE

DATE

I:\ACAD\PROJECTS\SUTTONBROOK\SUBFER\MXDCHERYL\TWN_AREFL.MXD SEP 18/18/2013 08:39:57 PM EDT (10.1.xxx) 2013-10 (W) Chrissie

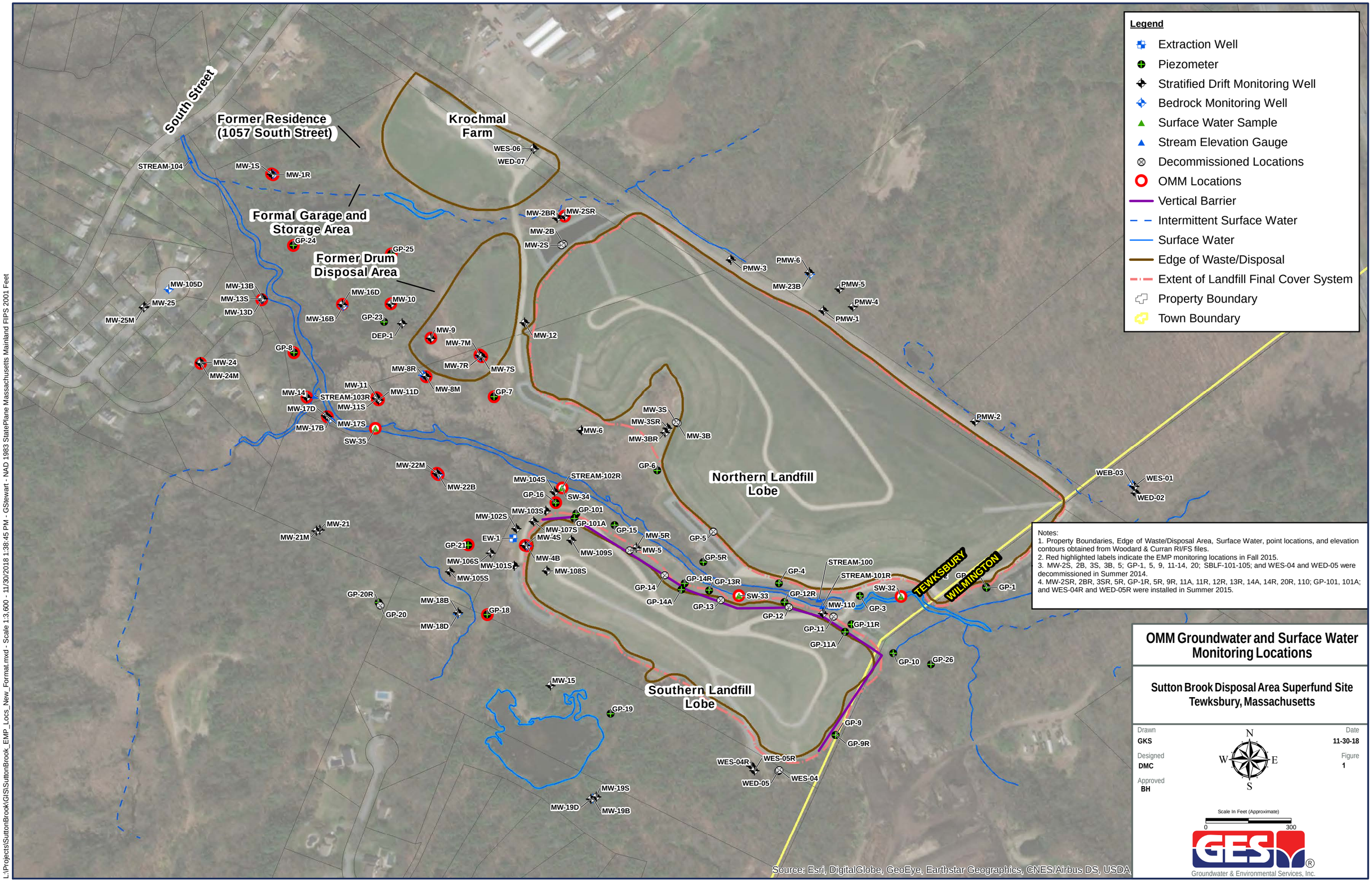
Appendix D.4
Sutton Brook Surface Water Data

Summary of Sutton Brook Surface Water Sampling

Analyte	Performance Standard[1] (ug/L)	Maximum Detection[2] (ug/L)			
		2011 to Spring 2014	Fall 2014 to Fall 2015	October 2017	October 2018
SW-32					
1,4-Dioxane	--	5.4	9.3	3.6	ND
2-Butanone (methyl ethyl ketone; MEK)	--	ND	26	ND	ND
Acetone	--	3.8	4.9	ND	ND
Tetrahydrofuran	--	3.4	3.9	ND	ND
Toluene	169	1.1	6.6	ND	ND
SW-33					
1,4-Dioxane	--	13	27	9.9	ND
2-Butanone (methyl ethyl ketone; MEK)	--	1.4	38	ND	ND
Acetone	--	4.2	12	ND	ND
Ethylbenzene	126	ND	0.85	ND	ND
Methylene chloride	--	ND	13	ND	ND
n-Propylbenzene	--	0.87	ND	ND	ND
Tetrahydrofuran	--	8.4	10	R	ND
Toluene	169	1.7	6.7	ND	ND
Xylenes	132	3.9	1.7	0.80	ND
SW-34					
1,1-Dichloroethane	--	0.51	ND	ND	ND
1,4-Dioxane	--	45	21	21	ND
2-Butanone (methyl ethyl ketone; MEK)	--	3.9	120	ND	ND
Acetone	--	6	63	ND	ND
Ethylbenzene	126	2.6	0.86	ND	ND
4-Methyl-2-pentanone (methyl isobutyl ketone; MIBK)	--	4.8	4	ND	ND
Tetrahydrofuran	--	29	53	R	ND
Toluene	169	21	18	ND	ND
Xylenes	132	10	5.5	0.74	ND
SW-35					
1,1-Dichloroethane	--	0.54	ND	NS	ND
1,4-Dioxane	--	25	17	NS	ND
2-Butanone (methyl ethyl ketone; MEK)	--	3.2	2.7	NS	ND
Acetone	--	4.4	19	NS	ND
Ethylbenzene	126	1.8	ND	NS	ND
4-Methyl-2-pentanone (methyl isobutyl ketone; MIBK)	--	3.8	ND	NS	ND
Tetrahydrofuran	--	29	13	NS	ND
Toluene	169	13	4.4	NS	ND
Xylenes	132	8	0.98	NS	ND

Notes

1. Revised performance standards from design (see Appendix C of this five-year review); all based on ecological risk.
   Performance standards are the calculated MATC (i.e., the geometric mean of the NOAEL and LOAEL benchmarks)
   -- - No cleanup level
   LOAEL - Lowest observable adverse effect level
   MATC - Maximum acceptable toxicant concnetration
   NOAEL - No observable adverse effect level
2. Data are from the following sources (all data included in this appendix except MIBK data for Oct 2017 which was not on table, but rather in lab reports in report):
   2011 to spring 2014 from Appendix D of Fall 2015 EMP Report (Geosyntec, 2016)
   Fall 2014 to fall 2015 from table in Fall 2015 EMP Report (Geosyntec, 2016)
   October 2017 data from the 4th Quarter 2017 Post Construction OMM Report (Oct 2017 - Dec 2017)
   October 2018 data from the 4th Quarter 2018 Post Construction OMM Report (Oct 2018 - Dec 2018)
   Data split to show results during various stages of construction (pre-, during, and post-).
   ND - Not detected
   NS - Not sampled
   R - Rejected as part of data validation



Legend

- Extraction Well
- Piezometer
- Stratified Drift Monitoring Well
- Bedrock Monitoring Well
- Surface Water Sample
- Stream Elevation Gauge
- Decommissioned Locations
- OMM Locations
- Vertical Barrier
- Intermittent Surface Water
- Surface Water
- Edge of Waste/Disposal
- Extent of Landfill Final Cover System
- Property Boundary
- Town Boundary

Notes:
1. Property Boundaries, Edge of Waste/Disposal Area, Surface Water, point locations, and elevation contours obtained from Woodard & Curran RI/FS files.
2. Red highlighted labels indicate the EMP monitoring locations in Fall 2015.
3. MW-2S, 2B, 3S, 3B, 5; GP-1, 5, 9, 11-14, 20; SBLF-101-105; and WES-04 and WED-05 were decommissioned in Summer 2014.
4. MW-2SR, 2BR, 3SR, 5R, GP-1R, 5R, 9R, 11A, 11R, 12R, 13R, 14A, 14R, 20R, 110; GP-101, 101A; and WES-04R and WED-05R were installed in Summer 2015.

OMM Groundwater and Surface Water Monitoring Locations

Sutton Brook Disposal Area Superfund Site
Tewksbury, Massachusetts

Drawn: GKS	Date: 11-30-18
Designed: DMC	Figure: 1
Approved: BH	

N W E S

Scale In Feet (Approximate)
0 300

Groundwater & Environmental Services, Inc.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA

L:\Projects\SuttonBrook\GIS\SuttonBrook_EMP_Locs_New_Format.mxd - Scale 1:3,600 - 11/30/2018 1:38:45 PM - GStewart - NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	SW-32-SW-09232011 9/23/2011			SW-32-SW-04022012 4/2/2012			SW-32-SW-09212012 9/21/2012			SW-32-SW-03262013 3/26/2013			SW-32-SW-09252013 9/25/2013			SW-32-SW-05062014 5/6/2014			FIELD DUPLICATE SW-1-09232011 [1] 9/23/2011			SW-33-SW-09232011 9/23/2011			SW-33-SW-04022012 4/2/2012			DUPLICATE-4-04022012 [2] 4/2/2012			SW-33-SW-09212012 9/21/2012		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																																			
	1,1,1-Trichloroethane	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	1,1,2-Trichloroethane	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	1,4-Dioxane	µg/L		0.92	J	<1.6		R		5.4	J	<1.6	1.8		<1.6	5.3		<1.6	3.3		<1.6	3.9	J	<1.6	3.4	J	<1.6	2.4		<1.6	3.1		<1.6	7.8	J	<1.6
	2-Butanone (MEK)	µg/L			UJ	<10		U	<10		U	<10		U	<10		U	<10		U	<10		UJ	<10		UJ	<10		U	<10		U	<10		U	<10
	Acetone	µg/L			UJ	<10		U	<10		U	<10	3.8	J	<10		U	<10		U	<10		UJ	<10		UJ	<10		U	<10		U	<10	3.1	J	<10
	Acrylonitrile	µg/L			UJ	<5		U	<5		U	<5		U	<5		U	<5		U	<5		UJ	<5		UJ	<5		U	<5		U	<5		U	<5
	Benzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Chloroform	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Ethyl benzene	µg/L	126		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Ethyl methacrylate	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			UJ	<5		U	<5		U	<5		U	<5		U	<5		U	<5		UJ	<5		UJ	<5		U	<5		U	<5		U	<5
	n-Propylbenzene	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Styrene	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L		1.7	J	<5		U	<5	3.4	J	<5		U	<5	2.4	J	<5		U	<5	7.8	J	<5	8.2	J	<5		U	<5		U	<5	8.3		<5
	Toluene	µg/L	169		U	<1		U	<1		U	<1	1.1		<1		U	<1		U	<1	1.5		<1	1.5		<1	1.1	J	<1	1		<1	1.7		<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Vinyl Chloride	µg/L			UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		UJ	<1		U	<1		U	<1		U	<1
	Xylenes (unspecified)	µg/L	132		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2	1.2	J	<2	1.2	J	<2	0.68	J	<2		UJ	<2	1.6	J	<2
Pesticides																																			
	DDT	µg/L			U	3		NS			NS			NS			NS			NS			U	2		U	2		NS			NS			NS	
Field Parameters																																			
	Dissolved Oxygen	mg/L		7.34			9.74			6.47			9.32			6.71			8.75			NS			6.88			9.47			NS			5.73		
	Iron, Ferrous	mg/L			U	<0.5	0.23			1.52			0.42			1.71			0.25			NS				U	<0.5	0.27			NS			0.53		
	Oxidation Reduction Potential	mV		23.6			88.4			1.9			-10.8			4			-46			NS			61.6			87.6			NS			14.1		
	pH	SU		6.58			6.77			6.75			6.46			6.65			6.74			NS			6.57			6.77			NS			6.76		
	Specific Conductivity	µS/cm		668			93			522			602			622			492			NS			716			95			NS			493		
	Temperature	°C		17.97			7.83			14.41			3.86			12			16.8			NS			17.9			7.16			NS			13.71		
	Turbidity, field	NTU		5.89			5.51			NS			2.52			6.3			2.81			NS			8.17			5.14			NS			NS		

Notes:

"J"=Compound detected below method quantitation limit or the result value is approximate due to minor quality control concern (see validation narrative for rationale), estimated value provided.

"U"=Compound not detected above method detection limit, quantitation limit provided.

"UJ"=The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"NM"=Not measured due to instrument malfunction.

"NS"=No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

Shading indicates exceedance of Surface Water Performance Standards (µg/L)

Surface Water Performance Standards from Record of Decision, SBDA, September, 2007.

Data that are J-qualified should not be used to support major remedial decision milestones, but may be used to provide a pre-construction baseline to supplement the RI/FS data.

[1, 2] This is a duplicate sample taken at SW-33

Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	FIELD DUPLICATE_1-SW-09212012 [3]			SW-33-SW-03262013			DUP-03-03262013 [4]			SW-33-SW-09252013			SW-DUP-SW-09252013 [5]			SW-33-SW-05062014			Dup-03-05062014 7			SW-34-SW-09232011			SW-34-SW-04022012			SW-34-SW-09262012			SW-34-SW-03263013			SW-34-SW-09252013		
				9/21/2012			3/26/2013			3/26/2013			9/25/2013			9/25/2013			5/6/2014			5/6/2014			9/23/2011			4/2/2012			9/26/2012			3/26/2013			9/25/2013		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																																						
	1,1,1-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1	
	1,1,2-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1	
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1	0.49	J	<1		U	<1	0.51	J	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dioxane	µg/L		9.6	J	<1.6	2.1		<1.6	1.8		<1.6	13		<1.6	13		<1.6	3.4		<1.6	3.4		<1.6	6.2	J	<1.6	5.7		<1.6	45	J	<1.6	2.5		<1.6	29		<1.6
	2-Butanone (MEK)	µg/L			U	<10	1.4	J	<10	1.4	J	<10		U	<10		U	<10		U	<10		U	<10	3.8	J	<10		U	<10	3.6	J	<10		U	<10	3.9	J	<10
	Acetone	µg/L		4.1	J	<10		UJ	<10	4.2	J	<10		U	<10		U	<10		U	<10		U	<10		U	<10	3.5	J	<10	6	J	<10	4.2	J	<10		U	<10
	Acrylonitrile	µg/L			U	<5		U	<5		U	<5		U	<5		U	<5		U	<5		U	<5		UJ	<5		U	<5		U	<5		U	<5		U	<5
	Benzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Chloroform	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Ethyl benzene	µg/L	126		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1	1.2		<1	1.4		<1	1.9		<1		U	<1	2.6		<1
	Ethyl methacrylate	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			U	<5		U	<5		U	<5		U	<5		U	<5		U	<5		U	<5	3.2	J	<5		U	<5	4.8	J	<5		U	<5	4.7	J	<5
	n-Propylbenzene	µg/L			U	<1		U	<1		U	<1	0.87	J	<1		UJ	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Styrene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L		8.4		<5		UJ	<5	1.5	J	<5	8.2		<5	8.2		<5		UJ	<5	2.5	J	<5	16	J	<5	10		<5	29		<5	5.3		<5	25		<5
	Toluene	µg/L	169	1.5		<1	0.99	J	<1	1.1	J	<1	1		<1	1		<1	0.98	J	<1	1	J	<1	10		<1	12		<1	16		<1	6		<1	21		<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Vinyl Chloride	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1
	Xylenes (unspecified)	µg/L	132	1.4	J	<2	1.1	J	<2	1.2	J	<2	3.9	J	<2	2.7	J	<2	0.89	J	<2	0.89	J	<2	5.3		<2	4.8		<2	9.2		<2	2		<2	10		<2
Pesticides																																						
	DDT	µg/L		NS			NS			NS			NS			NS			NS			NS			U	3		NS			NS			NS			NS		
Field Parameters																																						
	Dissolved Oxygen	mg/L		NS			9.29			NS			-1	Note 6		NS			9.69			NS			4.93			8.65			7.11			8.91			5.02		
	Iron, Ferrous	mg/L		NS			0.43			NS			1.01			NS			0.25			NS			U	<0.5		0.33			NS			0.48			1.52		
	Oxidation Reduction Potential	mV		NS			3			NS			6.22			NS			-37			NS			88.1			88.9			10.8			9			-16		
	pH	SU		NS			6.46			NS			6.75			NS			6.78			NS			6.57			6.76			6.93			6.36			6.79		
	Specific Conductivity	µS/cm		NS			602			NS			659			NS			403			NS			765			97			762			589			700		
	Temperature	°C		NS			4.13			NS			12.4			NS			17.1			NS			18.24			6.9			15.68			4.82			12.1		
	Turbidity, field	NTU		NS			3.56			NS			7.5			NS			6.51			NS			7.69			5.94			18.9			3.48			15		

Notes:

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"UJ"=The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"NM"=Not measured due to instrument malfunction.

"NS"=No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

Shading indicates exceedance of Surface Water Performance Standards (µg/L)

Surface Water Performance Standards from Record of Decision, SBDA, September, 2007.

Data that are J-qualified should not be used to support major remedial decision milestones, but may be used to provide a pre-construction baseline to supplement the RI/FS data.

[3, 4, 5, 7] This is a duplicate sample taken at SW-33

[6] The DO reported for SW-33 on 9/25/2013 is suspected to be a field measurement error.

Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	SW-34-SW-05062014			SW-35-SW-09232011			SW-35-SW-04022012			SW-35-SW-09242012			SW-35-SW-03262013			SW-35-SW-09252013			SW-35-SW-05062014		
				5/6/2014			9/23/2011			4/2/2012			9/24/2012			3/26/2013			9/25/2013			5/6/2014		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																								
	1,1,1-Trichloroethane	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,1,2-Trichloroethane	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1	0.53	J	<1		U	<1	0.54	J	<1		U	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dioxane	µg/L		6.2		<1.6	6.5	J	<1.6	11		<1.6	20	J	<1.6	5.2		<1.6	25		<1.6	6.8		<1.6
	2-Butanone (MEK)	µg/L			U	<10		UJ	<10		U	<10		U	<10		U	<10	3.2	J	<10		U	<10
	Acetone	µg/L			U	<10		U	<10	4.4	J	<10	4.2	J	<10	3.8	J	<10		U	<10		U	<10
	Acrylonitrile	µg/L			U	<5		UJ	<5		U	<5		U	<5		U	<5		U	<5		U	<5
	Benzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Chloroform	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2		U	<2		U	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Ethyl benzene	µg/L	126		U	<1		U	<1	1.5		<1		U	<1		U	<1	1.8		<1	0.92	J	<1
	Ethyl methacrylate	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			U	<5		UJ	<5		U	<5		U	<5		U	<5	3.8	J	<5	2.2	J	<5
	n-Propylbenzene	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Styrene	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L		9.2		<5	13	J	<5	17		<5	29		<5	6.6		<5	28		<5	9.3		<5
	Toluene	µg/L	169	4.5		<1	2.9		<1	12		<1	0.99	J	<1	6.9		<1	13		<1	8.8		<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Vinyl Chloride	µg/L			U	<1		UJ	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Xylenes (unspecified)	µg/L	132	1	J	<2	1.8	J	<2	5.3		<2	1.6	J	<2	2.2		<2	8		<2	3.4		<2
Pesticides																								
	DDT	µg/L			NS			U	3		NS			NS			NS			NS			NS	
Field Parameters																								
	Dissolved Oxygen	mg/L			9.54		3.45			7.73			1.45			8.9			4.84			0.07		
	Iron, Ferrous	mg/L			46			U	<0.5	0.1			0.05			0.2			0.04			0.25		
	Oxidation Reduction Potential	mV			-29.5		135.3			61.5			26.9			4.9			29.6			-52.8		
	pH	SU			7.17		6.41			6.64			6.75			6.53			6.76			7.13		
	Specific Conductivity	µS/cm			513		771			103			673			604			723			766		
	Temperature	°C			15.98		18.43			7.14			13.07			8.13			14.1			11		
	Turbidity, field	NTU			4.91		17.3			8.72			9.01			3.2			11.4			3.57		

Notes:

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Surface Water Performance Standards from Record of Decision, SBDA, September, 2007.

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Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	SW-32-SW-10312014			SW-32-SW-5112015			SW-32-SW-10262015			SW-33-SW-10312014			SW-33-SW-10312014-DUP			SW-33-SW-5112015		
				10/31/2014			5/11/2015			10/26/2015			10/31/2014			10/31/2014			5/11/2015		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																					
	1,1,1-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,1,2-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,2-Dichloropropane	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,4-Dichlorobenzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	1,4-Dioxane	µg/L			U	<1.6	4.3	J	<6.4	9.3		<1.6	27	J	<1.6	14	J	<1.6	6.4		<6.4
	2-Butanone (MEK)	µg/L		26		<10	4.5	J	<10		U	<10	33		<10	38	J	<200		UJ	<10
	Acetone	µg/L			U	<10	4.9	J	<10		U	<10	12		<10		U	<200	5.4	J	<10
	Acrylonitrile	µg/L			U	<5		U	<5		U	<5		U	<5		U	<100		UJ	<5
	Benzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Carbon tetrachloride	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Chloroform	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2		U	<2		U	<40		UJ	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Dichloromethane (Methylene chloride)	µg/L			U	<1		U	<1		U	<1		UJ	<1	13	J	<20		UJ	<1
	Ethyl benzene	µg/L	126		U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Ethyl methacrylate	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			U	<5		U	<5		U	<5		U	<5		U	<100		UJ	<5
	n-Propylbenzene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Styrene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Tetrahydrofuran	µg/L			U	<5		U	<5	3.9	J	<5		U	<5		U	<100	6.3	J	<5
	Toluene	µg/L	169	3		<1	6.6		<1		U	<1	3.9		<1		U	<20	6.7	J	<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Vinyl Chloride	µg/L			U	<1		U	<1		U	<1		U	<1		U	<20		UJ	<1
	Xylenes (unspecified)	µg/L	132		U	<2		U	<2		U	<2		U	<2		U	<40	0.67	J	<2
Field Parameters																					
	Dissolved Oxygen	mg/L		2.99			5.95			6.7			5.61			NS			5.43		
	Iron, Ferrous	mg/L		0.5			0.25			1			0.75			NS			2		
	Oxidation Reduction Potential	mV		-21.6			52.1			59			-39.2			NS			80.9		
	pH	SU		6.91			6.83			6.87			6.39			NS			7.09		
	Specific Conductivity	µS/cm		506			987			701			521			NS			994		
	Temperature	℃		8.92			20.92			8.6			8.9			NS			21		
	Turbidity, field	NTU		8.6			11.6			12.7			5.9			NS			9.98		

Notes:

"J" = Compound detected below method quantitation limit or the result value is approximate due to minor quality control concern (see validation narrative for rationale), estimated value provided.

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"R"=Result rejected due to low or no matrix spike recovery.

"QL" = Quantitation Limit

"Qual" = Laboratory and/or data validation Qualifier

"NS" = Not sampled

Shading indicates exceedance of Surface Water Performance Standards (µg/L).

Surface Water Performance Standards from the Final Design Report, July 2013.

Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	SW-33-SW-5112015-DUP			SW-33-SW-10262015			SW-33-SW-10262015 DUP			SW-34-SW-10312014			SW-34-SW-572015			SW-34-SW-10262015		
				5/11/2015			10/26/2015			10/26/2015			10/31/2014			5/7/2015			10/26/2015		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																					
	1,1,1-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,1,2-Trichloroethane	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,2-Dichloropropane	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	1,4-Dioxane	µg/L		7.1		<6.4	13		<1.6	14		<1.6	9.9		<1.6	3.8		<1.6	21		<1.6
	2-Butanone (MEK)	µg/L			U	<10		U	<10		U	<10	120		<40		U	<10		U	<10
	Acetone	µg/L		5.3	J	<10		U	<10		U	<10	63		<40	5.6	J	<10	5.6	J	<10
	Acrylonitrile	µg/L			U	<5		U	<5		U	<5		U	<20		U	<5		U	<5
	Benzene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Carbon tetrachloride	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Chloroform	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2		U	<8		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Ethyl benzene	µg/L	126		U	<1	0.8	J	<1	0.85	J	<1		U	<4		U	<1	0.86	J	<1
	Ethyl methacrylate	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			U	<5		U	<5		U	<5		U	<20		U	<5	4	J	<5
	n-Propylbenzene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Styrene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Tetrahydrofuran	µg/L		6.5		<5	9.8		<5	10		<5	53		<20	6.8		<5	16		<5
	Toluene	µg/L	169	6.6		<1	4		<1	4.1		<1	18		<4	5.5		<1	12		<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1		U	<4		U	<1		U	<1
	Vinyl Chloride	µg/L			U	<1		U	<1		U	<1		U	<4		UJ	<1		U	<1
	Xylenes (unspecified)	µg/L	132		UJ	<2	1.5	J	<2	1.7	J	<2	5.5	J	<8		U	<2	2.1		<2
Field Parameters																					
	Dissolved Oxygen	mg/L		NS			9.07			NS			2.45			8.62			8.52		
	Iron, Ferrous	mg/L		NS			0.5			NS			0			0			0.5		
	Oxidation Reduction Potential	mV		NS			145.2			NS			-65.1			110.6			147.8		
	pH	SU		NS			7.23			NS			6.76			6.59			7.97		
	Specific Conductivity	µS/cm		NS			771			NS			816			1100			806		
	Temperature	°C		NS			11.02			NS			8.6			24			10.58		
	Turbidity, field	NTU		NS			19.6			NS			9.83			35.9			17		

Notes:

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"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"R"=Result rejected due to low or no matrix spike recovery.

"QL" = Quantitation Limit

"Qual" = Laboratory and/or data validation Qualifier

"NS" = Not sampled

Shading indicates exceedance of Surface Water Performance Standards (µg/L).

Surface Water Performance Standards from the Final Design Report, July 2013.

Table 3- Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Surface Water Performance Standards (µg/L)	SW-35-SW-10302014			SW-35-SW-572015			SW-35-SW-10262015		
				10/30/2014			5/7/2015			10/26/2015		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds												
	1,1,1-Trichloroethane	µg/L			U	<1		U	<1		U	<1
	1,1,2-Trichloroethane	µg/L			U	<1		U	<1		U	<1
	1,1-Dichloroethane	µg/L			U	<1		U	<1		U	<1
	1,1-Dichloroethene	µg/L			U	<1		U	<1		U	<1
	1,2-Dichloroethane	µg/L			U	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L			U	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L			U	<1		U	<1		U	<1
	1,4-Dioxane	µg/L			U	<8	16		<8	17		<1.6
	2-Butanone (MEK)	µg/L		2.7	J	<10		U	<10		U	<10
	Acetone	µg/L		19		<10	9.6	J	<10	4.5	J	<10
	Acrylonitrile	µg/L			U	<5		U	<5		U	<5
	Benzene	µg/L			U	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L			U	<1		U	<1		U	<1
	Chloroform	µg/L			U	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L			U	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L			U	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L			U	<1		U	<1		U	<1
	Ethyl benzene	µg/L	126		U	<1		U	<1		U	<1
	Ethyl methacrylate	µg/L			U	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L			U	<5		U	<5		U	<5
	n-Propylbenzene	µg/L			U	<1		U	<1		U	<1
	Styrene	µg/L			U	<1		U	<1		U	<1
	Tetrachloroethene	µg/L			U	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L			U	<5	11		<5	13		<5
	Toluene	µg/L	169	1.6		<1	1.2		<1	4.4		<1
	Trichloroethene	µg/L			U	<1		U	<1		U	<1
	Vinyl Chloride	µg/L			U	<1		U	<1		U	<1
	Xylenes (unspecified)	µg/L	132		U	<2		U	<2	0.98	J	<2
Field Parameters												
	Dissolved Oxygen	mg/L		1.04			4.65			7.22		
	Iron, Ferrous	mg/L		1			0.5			1		
	Oxidation Reduction Potential	mV		5.9			164.5			35.8		
	pH	SU		5.95			6.63			6.76		
	Specific Conductivity	µS/cm		229			754			904		
	Temperature	°C		10.71			18.08			8.70		
	Turbidity, field	NTU		1.26			68			12.7		

Notes:

"J" = Compound detected below method quantitation limit or the result value is approximate due to minor quality control concern (see validation narrative for rationale), estimated value provided.

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"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"R"=Result rejected due to low or no matrix spike recovery.

"QL" = Quantitation Limit

"Qual" = Laboratory and/or data validation Qualifier

"NS" = Not sampled

Shading indicates exceedance of Surface Water Performance Standards (µg/L).

Surface Water Performance Standards from the Final Design Report, July 2013.

Table 6. Surface Water Monitoring Results - October 2017
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Surface Water											
			Sample ID	SW-32				SW-33				SW-34			
			Date	09 Oct 2017				09 Oct 2017				09 Oct 2017			
Parameter	Units	Surface Water Performance Standards (µg/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters\ Geochemistry															
Dissolved Oxygen	mg/l	---		8.65				6.87				5.05			
Iron, Ferrous	mg/l	---		NM(1)				NM(1)				NM(1)			
Oxidation Reduction Potential	mV	---		64.2				35.3				-19.4			
pH	SU	---		7.66				7.08				7.08			
Specific Conductance	µs/cm	---		781				769				942			
Temperature	deg C	---		17.93				18.75				19.86			
Turbidity	NTU	---		NM(1)				NM(1)				NM(1)			
Volatile Organic Compounds															
1,1,1-Trichloroethane	µg/l	---		< 0.82	U		1.0	< 0.82	U		1.0	< 0.82	U		1.0
1,1,2-Trichloroethane	µg/l	---		< 0.23	U		1.0	< 0.23	U		1.0	< 0.23	U		1.0
1,1-Dichloroethane	µg/l	---		< 0.38	U		1.0	< 0.38	U		1.0	< 0.38	U		1.0
1,1-Dichloroethene	µg/l	---		< 0.29	U		1.0	< 0.29	U		1.0	< 0.29	U		1.0
1,2-Dichloroethane	µg/l	---		< 0.21	U		1.0	< 0.21	U		1.0	< 0.21	U		1.0
1,2-Dichloropropane	µg/l	---		< 0.72	U		1.0	< 0.72	U		1.0	< 0.72	U		1.0
1,4-Dichlorobenzene	µg/l	---		< 0.84	U		1.0	< 0.84	U		1.0	< 0.84	U		1.0
1,4-Dioxane	µg/l	---		3.6			1.6	9.9			3.2	21			3.2
2-Butanone (MEK)	µg/l	---		< 1.3	U		10	< 1.3	U		10	< 1.3	U		10
Acetone	µg/l	---		< 3.0	J	U	10	< 3.0	J	U	10	< 3.0	J	U	10
Acrylonitrile	µg/l	---		< 0.83	U		5.0	< 0.83	U		5.0	< 0.83	U		5.0
Benzene	µg/l	---		< 0.41	U		1.0	< 0.41	U		1.0	< 0.41	U		1.0
Carbon tetrachloride	µg/l	---		< 0.27	U		1.0	< 0.27	U F1		1.0	< 0.27	U		1.0
Chloroform	µg/l	---		< 0.34	U		1.0	< 0.34	U		1.0	< 0.34	U		1.0
cis/trans 1,2-Dichloroethene	µg/l	---		< 0.81	U		2.0	< 0.81	U		2.0	< 0.81	U		2.0
cis-1,2-Dichloroethene	µg/l	---		< 0.81	U		1.0	< 0.81	U		1.0	< 0.81	U		1.0
Dichloromethane (Methylene chloride)	µg/l	---		< 0.44	U		1.0	< 0.44	U		1.0	< 0.44	U		1.0
Ethyl benzene	µg/l	126		< 0.74	U		1.0	< 0.74	U		1.0	< 0.74	U		1.0
Ethyl methacrylate	µg/l	---		< 0.59	U		1.0	< 0.59	U		1.0	< 0.59	U		1.0
n-Propylbenzene	µg/l	---		< 0.69	U		1.0	< 0.69	U		1.0	< 0.69	U		1.0
Styrene	µg/l	---		< 0.73	U		1.0	< 0.73	U		1.0	< 0.73	U		1.0
Tetrachloroethene	µg/l	---		< 0.36	U		1.0	< 0.36	U		1.0	< 0.36	U		1.0
Tetrahydrofuran	µg/l	---		< 1.3	J	U	5.0	7.9		R	5.0	< 1.3		R	5.0
Toluene	µg/l	169		< 0.51	U		1.0	< 0.51	U		1.0	< 0.51	U		1.0
Trichloroethene	µg/l	---		< 0.46	U		1.0	< 0.46	U		1.0	< 0.46	U		1.0
Vinyl Chloride	µg/l	---		< 0.90	U		1.0	< 0.90	U		1.0	< 0.90	U		1.0
Xylenes (unspecified)	µg/l	132		< 0.66	U		2.0	0.80	J		2.0	0.74	J		2.0

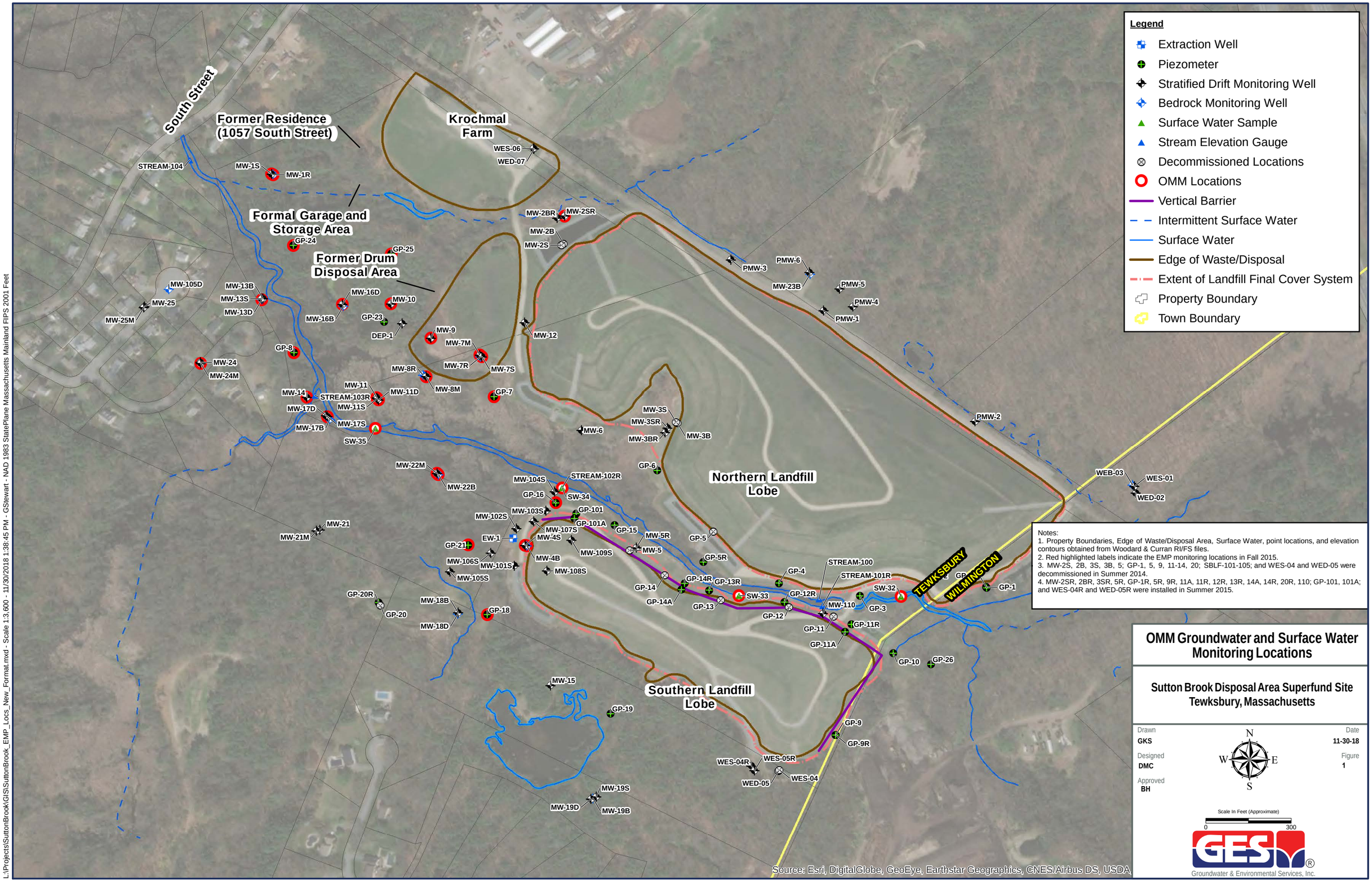
Notes
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
F1 = MS and/or MSD Recovery is outside acceptance limits.
R = Result rejected due to low or no matrix spike recovery.
RL = Reporting Limit.
NM(1) = Not measured due to field work directive misinterpretation by field staff.
Qual = Laboratory (LQual) and/or data validation (VQual) qualifier.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius.
mg/L = milligrams per liter.
µg/L = micrograms per liter.
mV = millivolts.
NTU = Nephelometric turbidity unit.
SU - Standard units of pH.
µs/cm = micro-siemens per centimeter.

Table 6
Surface Water Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Sample Location ID		SW-32				SW-33				SW-34				SW-35				Surface Water Performance Standards
Lab ID		SW-32-SW-10082018				SW-33-SW-10082018				SW-34-SW-10082018				SW-35-SW-10082018				
Date		10/8/2018				10/8/2018				10/8/2018				10/8/2018				
Parameter	**Units**	**Result**	**LQual**	**VQual**	**RL**	**Result**	**LQual**	**VQual**	**RL**	**Result**	**LQual**	**VQual**	**RL**	**Result**	**LQual**	**VQual**	**RL**	**(ug/L)**
Field Measures																		
Dissolved Oxygen	mg/l	8.93				8.56				7.24				6.42				---
FERROUS IRON	ug/l	0.5				0.5				0.5				0.5				---
ORP	mV	89.6				93.9				107.6				63.0				---
Specific Conductivity	µs/cm	816				821				830				857				---
Turbidity	NTU	9.45				6.74				10.1				11.4				---
Well pH	SU	6.90				6.96				6.93				7.12				---
Well Temperature	deg c	12.98				12.29				12.92				14.31				---
Volatile Organic Compounds																		
1,1,1-Trichloroethane	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,1,2-Trichloroethane	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,1-Dichloroethane	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,1-Dichloroethene	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,2-Dichloroethane	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,2-Dichloroethene (Total)	ug/l	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	---
1,2-Dichloropropane	ug/l	< 1.0	U		1.0	< 1.0	U F1		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,4-Dichlorobenzene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
1,4-Dioxane	ug/l	<40	U		40	<40	U		40	<40	U		40	<40	U		40	---
2-Butanone	ug/l	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	---
4-Methyl-2-pentanone	ug/l	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U		5.0	---
Acetone	ug/l	< 10	J	U at RL	10	< 10	J	U at RL	10	< 10	J	U at RL	10	< 10	J	U at RL	10	---
Acrylonitrile	ug/l	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U		5.0	---
Benzene	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Carbon tetrachloride	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Chloroform	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
cis-1,2-Dichloroethene	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Ethyl Methacrylate	ug/l	< 1.0	U		1.0	< 1.0	U F1		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Ethylbenzene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	126
Methylene chloride	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	J	U at RL	1.0	---
n-Propylbenzene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Styrene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Tetrachloroethene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Tetrahydrofuran	ug/l	< 5.0	U		5.0	< 5.0	J	U at RL	5.0	<5.0	J	U at RL	5.0	< 8.2		U at 8.2	8.2	---
Toluene	ug/l	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	169
Trichloroethene	ug/l	< 1.0	U		1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Vinyl Chloride	ug/l	< 1.0	U	UJ	1.0	< 1.0	U F2		1.0	< 1.0	U		1.0	< 1.0	U		1.0	---
Xylenes, Total	ug/l	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	132

Notes:
mg/L = milligrams per liter
µg/L = micrograms per liter
mV = millivolts
µs/cm = micro-siemens per centimeter
NTU = Nephelometric turbidity unit
SU - Standard units of pH
deg C = Degrees in celcius
"---" = No performance standard
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
LQual = Laboratory and/or data validation Qualifier
VQual = Validation Qualifier
RL = Reporting Limit
J = Concentration is approximate (see validation narrative for rationale), estimated value provided
U = Compound not detected above method detection limit, quantitation limit provided.
UJ = An analyte was not detected above MDL, quantitayion limit provided. However, the reported quantitation limit is approximate.
UF1 = Compound not detected above the method detection limit, quantitation limit provided. However, MS and/or MSD Recovery is outside acceptance limits.
UF2 = Compound not detected above the method detection limit, quantitation limit provided. However the MS/MSD RPD exceeds control limits.

Appendix D.5
Groundwater Data



Legend

- Extraction Well
- Piezometer
- Stratified Drift Monitoring Well
- Bedrock Monitoring Well
- Surface Water Sample
- Stream Elevation Gauge
- Decommissioned Locations
- OMM Locations
- Vertical Barrier
- Intermittent Surface Water
- Surface Water
- Edge of Waste/Disposal
- Extent of Landfill Final Cover System
- Property Boundary
- Town Boundary

Notes:
1. Property Boundaries, Edge of Waste/Disposal Area, Surface Water, point locations, and elevation contours obtained from Woodard & Curran RI/FS files.
2. Red highlighted labels indicate the EMP monitoring locations in Fall 2015.
3. MW-2S, 2B, 3S, 3B, 5; GP-1, 5, 9, 11-14, 20; SBLF-101-105; and WES-04 and WED-05 were decommissioned in Summer 2014.
4. MW-2SR, 2BR, 3SR, 5R, GP-1R, 5R, 9R, 11A, 11R, 12R, 13R, 14A, 14R, 20R, 110; GP-101, 101A; and WES-04R and WED-05R were installed in Summer 2015.

OMM Groundwater and Surface Water Monitoring Locations

Sutton Brook Disposal Area Superfund Site
Tewksbury, Massachusetts

Drawn: GKS	Date: 11-30-18
Designed: DMC	Figure: 1
Approved: BH	

N W E S

Scale In Feet (Approximate)
0 300

Groundwater & Environmental Services, Inc.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA

L:\Projects\SuttonBrook\GIS\SuttonBrook_EMP_Locs_New_Format.mxd - Scale 1:3,600 - 11/30/2018 1:38:45 PM - GStewart - NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

VISL Evaluation for VOCs detected in Groundwater (October 2018)

Detected VOCs[1]	Units	ROD Performance Standard	Maximum Detection	December 2018 VISL	
				HI=1; Risk=1E-04	HI=1; Risk=1E-06
1,1,1-Trichloroethane	ug/l	200	ND		
1,1,2-Trichloroethane	ug/l	5	ND		
1,1-Dichloroethane	ug/l	360	3.5	764	8
1,1-Dichloroethene	ug/l	7	3.3	195	195
1,2-Dichloroethane	ug/l	5	0.4	151	2
1,2-Dichloroethene (Total)	ug/l	--	1	--	--
1,2-Dichloropropane	ug/l	5	ND		
1,4-Dichlorobenzene	ug/l	75	ND		
1,4-Dioxane	ug/l	4	140	159000	2860
2-Butanone	ug/l	4000	ND		
4-Methyl-2-pentanone	ug/l	800	ND		
Acetone	ug/l	5600	ND		
Acrylonitrile	ug/l	0.05	ND		
Benzene	ug/l	5	25	138	2
Carbon tetrachloride	ug/l	5	ND		
Chloroform	ug/l	80	ND		
cis-1,2-Dichloroethene	ug/l	70	1	--	--
Ethyl methacrylate	ug/l	260	ND		
Ethylbenzene	ug/l	700	ND		
Methylene chloride	ug/l	5	25	4710	763
n-Propylbenzene	ug/l	52	ND		
Styrene	ug/l	100	ND		
Tetrachloroethene	ug/l	5	ND		
Tetrahydrofuran	ug/l	227	1600	724000	724000
Toluene	ug/l	1000	ND		
Trichloroethene	ug/l	5	0.83	5	1
Vinyl chloride	ug/l	2	ND		
Xylenes, Total	ug/l	10000	160	385	385

Notes

1. See Groundwater data from October 2018 in this appendix; Downgradient Groundwater Area including GSA.
2. Only showing VISLs for detected analytes; Target groundwater concentrations.

-- - No standard or VISL

VOC - volatile organic compound

HI - Hazard Index

VISL - Vapor Intrusion Screening Level

ROD - Record of Decision (2007)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Downgradient Groundwater Area Including GSA															
			Sample ID	GP-8				GP-24				GP-25				MW-1R			
			Date	10/09/2018				10/10/2018				10/10/2018				10/09/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		0.68				0.63				2.78				0.15			
Iron, Ferrous	ug/l	---		0				2.0				2.5				0			
Nitrate-N	mg/l	---		1.0	H	J-	0.050	0.035	JH	J-	0.050	< 0.020	UH	UJ-	0.050	< 0.020	UH	UJ-	0.050
Oxidation Reduction Potential	mV	---		152.8				-42.8				-97.6				87.2			
pH	S.U.	---		6.10				6.76				6.81				7.85			
Specific Conductivity	MS/CM	---		424				448				2825				197			
Sulfate as SO4	mg/l	---		41.6			10.0	8.5			5.0	35.5			25.0	11.4			5.0
Temperature	deg c	---		14.15				12.98				14.4				15.00			
Turbidity	NTU	---		1.52				1.59				1.03				3.66			
Metals																			
Arsenic	ug/l	10		0.34	J		1.0	9.7			1.0	1120			1.0	16.3			1.0
Arsenic, Dissolved	ug/l	10		0.28	J		1.0	10.7			1.0	1330			1.0	16.3			1.0
Manganese	ug/l	300		342			3.0	794			3.0	5290			3.0	164			3.0
Manganese, Dissolved	ug/l	300		308	^ B	J+	3.0	780	B		3.0	5140	^ B	J+	3.0	101	^ B	J+	3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		< 0.43	U		1.0	1.6			1.0	41.5			1.0	< 0.43	U		1.0
TOC Result 2	mg/l	---		< 0.43	U		1.0	1.7			1.0	41.5			1.0	< 0.43	U		1.0
Total Organic Carbon	mg/l	---		< 0.43	U		1.0	1.7			1.0	41.5			1.0	< 0.43	U		1.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 0.82	U		1.0	< 0.82	U		1.0	< 4.1	U		5.0	< 0.82	U		1.0
1,1,2-Trichloroethane	ug/l	5		< 0.23	U		1.0	< 0.23	U		1.0	< 1.2	U		5.0	< 0.23	U		1.0
1,1-Dichloroethane	ug/l	360		< 0.38	U		1.0	< 0.38	U		1.0	< 1.9	U		5.0	< 0.38	U		1.0
1,1-Dichloroethene	ug/l	7		< 0.29	U		1.0	< 0.29	U		1.0	< 1.5	U		5.0	< 0.29	U		1.0
1,2-Dichloroethane	ug/l	5		< 0.21	U		1.0	< 0.21	U		1.0	< 1.1	U		5.0	< 0.21	U		1.0
1,2-Dichloroethene (Total)	ug/l	---		< 0.81	U		2.0	< 0.81	U		2.0	< 4.1	U		10	< 0.81	U		2.0
1,2-Dichloropropane	ug/l	5		< 0.72	U		1.0	< 0.72	U		1.0	< 3.6	U		5.0	< 0.72	U		1.0
1,4-Dichlorobenzene	ug/l	75		< 0.84	U		1.0	< 0.84	U		1.0	< 4.2	U		5.0	< 0.84	U		1.0
1,4-Dioxane	ug/l	4		1.7			1.6	3.3			1.6	70			32	< 0.61	U		1.6
2-Butanone	ug/l	4000		< 1.3	U		10	< 1.3	U		10	< 6.6	U		50	< 1.3	U		10
4-Methyl-2-pentanone	ug/l	800		< 2.1	U		5.0	< 2.1	U		5.0	< 11	U		25	< 2.1	U		5.0
Acetone	ug/l	5600		< 3.0	U		10	< 3.0	U		10	< 15	U		50	< 3.0	U		10
Acrylonitrile	ug/l	0.05		< 0.83	U		5.0	< 0.83	U		5.0	< 4.2	U		25	< 0.83	U		5.0
Benzene	ug/l	5		< 0.41	U		1.0	< 0.41	U		1.0	< 2.1	U		5.0	< 0.41	U		1.0
Carbon tetrachloride	ug/l	5		< 0.27	U		1.0	< 0.27	U		1.0	< 1.4	U		5.0	< 0.27	U		1.0
Chloroform	ug/l	80		1.4		U at 1.4	1.0	< 0.34	U		1.0	< 1.7	U		5.0	< 0.34	U		1.0
cis-1,2-Dichloroethene	ug/l	70		< 0.81	U		1.0	< 0.81	U		1.0	< 4.1	U		5.0	< 0.81	U		1.0
Ethyl Methacrylate	ug/l	260		< 0.59	U		1.0	< 0.59	U		1.0	< 3.0	U		5.0	< 0.59	U		1.0
Ethylbenzene	ug/l	700		< 0.74	U		1.0	< 0.74	U		1.0	< 3.7	U		5.0	< 0.74	U		1.0
Methylene chloride	ug/l	5		0.46	J		1.0	< 0.44	U		1.0	< 2.2	U		5.0	0.50	J		1.0
n-Propylbenzene	ug/l	52		< 0.69	U		1.0	< 0.69	U		1.0	< 3.5	U		5.0	< 0.69	U		1.0
Styrene	ug/l	100		< 0.73	U		1.0	< 0.73	U		1.0	< 3.7	U		5.0	< 0.73	U		1.0
Tetrachloroethene	ug/l	5		< 0.36	U		1.0	< 0.36	U		1.0	< 1.8	U		5.0	< 0.36	U		1.0
Tetrahydrofuran	ug/l	227		< 1.3	U		5.0	< 1.3	U		5.0	50			25	< 1.3	U		5.0
Toluene	ug/l	1000		< 0.51	U		1.0	< 0.51	U		1.0	< 2.6	U		5.0	< 0.51	U		1.0
Trichloroethene	ug/l	5		< 0.46	U		1.0	< 0.46	U		1.0	< 2.3	U		5.0	< 0.46	U		1.0
Vinyl Chloride	ug/l	2		< 0.90	U		1.0	< 0.90	U		1.0	< 4.5	U		5.0	< 0.90	U		1.0
Xylenes, Total	ug/l	10000		< 0.66	U		2.0	< 0.66	U		2.0	< 3.3	U		10	< 0.66	U		2.0
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		< 0.40	U		5.0	< 0.40	U		5.0	< 2.0	U		25	< 0.40	U		5.0
2-Toluidine	ug/l	0.2		< 1.5	U		10	< 1.5	U		10	< 7.4	U		50	< 1.5	U		10
3-Methylphenol and 4-Methylphenol	ug/l	470		< 0.36	U		10	< 0.36	U		10	< 1.8	U		50	< 0.36	U		10
bis(2-Ethylhexyl) phthalate	ug/l	6		< 2.2	U		5.0	< 2.2	U		5.0	< 11	U		25	< 2.2	U		5.0
Naphthalene	ug/l	100		< 0.76	U		5.0	< 0.76	U		5.0	< 3.8	U		25	< 0.76	U		5.0
N-Nitroso-di-n-butylamine	ug/l	0.003		< 0.60	U		10	< 0.60	U		10	< 3.0	U		50	< 0.60	U		10
N-Nitrosopyrrolidine	ug/l	0.03		< 2.5	U		10	< 2.5	U		10	< 13	U		50	< 2.5	U		10
Phenol	ug/l	2000		< 0.39	U		5.0	< 0.39	U		5.0	< 2.0	U		25	< 0.39	U		5.0
Pyridine	ug/l	9		0.76	J		25	0.65	J		25	< 2.1	U		130	0.79	J		25

Notes:
"---" = No performance standard applicable
"F1" = MS and/or MSD Recovery is outside acceptance limits.
"H" = Sample was prepped or analyzed beyond the specified holding time
"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the MDL (see validation narrative for rationale), estimated value provided.
"J+" = Estimated J value with a possible high bias
"J-" = Estimated J value with a possible low bias
"U" = Compound not detected above method detection limit, quantitation limit provided
"UJ" = The analyte was not detected above the MDL, quantitation limit provided. However, the reported quantitation limit is approximate
"UJ-" = Estimated non-detect with possible low bias
"UH" = Compound not detected above method detection limit, quantitation limit provided. However, Sample was prepped or analyzed beyond the specified holding time.
"JH" = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. However, Sample was prepped or analyzed beyond the specified holding time
"F2J" = MS/MSD RPD exceeds control limits. However, Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
µS/cm = microsiemens per centimenter
Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Downgradient Groundwater Area Including GSA															
			Sample ID	MW-1S				MW-10				MW-11				MW-11D			
			Date	10/09/2018				10/09/2018				10/09/2018				10/09/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		0.22				0.96				2.59				0.48			
Iron, Ferrous	ug/l	---		4.5				1.0				3.5				3.0			
Nitrate-N	mg/l	---		0.023	J		0.050	< 0.020	U		0.050	0.023	JH	J-	0.050	< 0.020	UH	UJ-	0.050
Oxidation Reduction Potential	mV	---		95.9				-16.7				-83.3				-125.8			
pH	S.U.	---		5.35				6.78				6.53				7.24			
Specific Conductivity	MS/CM	---		72				502				1877				567			
Sulfate as SO4	mg/l	---		6.2			5.0	13.5			5.0	< 1.4	U		5.0	3.1	F2 J		5.0
Temperature	deg c	---		16.06				15.58				16.75				14.37			
Turbidity	NTU	---		77.5				37.4				1.18				1.08			
Metals																			
Arsenic	ug/l	10		34.4			1.0	44.3			1.0	2860			1.0	50.9	F1	J+	1.0
Arsenic, Dissolved	ug/l	10		6.3			1.0	12.1			1.0	2350			1.0	50.8			1.0
Manganese	ug/l	300		195			3.0	4620			3.0	189			3.0	1000			3.0
Manganese, Dissolved	ug/l	300		156	^ B	J+	3.0	4380	^ B	J+	3.0	189	^ B	J+	3.0	924	B		3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		3.1			1.0	3.1			1.0	41.2			1.0	5.9			1.0
TOC Result 2	mg/l	---		3.1			1.0	2.9			1.0	40.7			1.0	5.8			1.0
Total Organic Carbon	mg/l	---		3.1			1.0	3.0			1.0	41.0			1.0	5.9			1.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 0.82	U		1.0	< 0.82	U		1.0	< 16	U		20	< 0.82	U		1.0
1,1,2-Trichloroethane	ug/l	5		< 0.23	U		1.0	< 0.23	U		1.0	< 4.6	U		20	< 0.23	U		1.0
1,1-Dichloroethane	ug/l	360		< 0.38	U		1.0	3.5			1.0	< 7.6	U		20	< 0.38	U		1.0
1,1-Dichloroethene	ug/l	7		< 0.29	U		1.0	3.3			1.0	< 5.8	U		20	< 0.29	U		1.0
1,2-Dichloroethane	ug/l	5		< 0.21	U		1.0	< 0.21	U		1.0	< 4.2	U		20	0.40	J		1.0
1,2-Dichloroethene (Total)	ug/l	---		< 0.81	U		2.0	< 0.81	U		2.0	< 16	U		40	< 0.81	U		2.0
1,2-Dichloropropane	ug/l	5		< 0.72	U		1.0	< 0.72	U		1.0	< 14	U		20	< 0.72	U		1.0
1,4-Dichlorobenzene	ug/l	75		< 0.84	U		1.0	< 0.84	U		1.0	< 17	U		20	< 0.84	U		1.0
1,4-Dioxane	ug/l	4		< 0.61	U		1.6	6.6			1.6	140			16	54	F1	J-	16
2-Butanone	ug/l	4000		< 1.3	U		10	< 1.3	U		10	< 26	U		200	< 1.3	U		10
4-Methyl-2-pentanone	ug/l	800		< 2.1	U		5.0	< 2.1	U		5.0	< 42	U		100	< 2.1	U		5.0
Acetone	ug/l	5600		< 3.0	U		10	3.8	J	U at RL	10	< 60	U		200	4.1	J	U at RL	10
Acrylonitrile	ug/l	0.05		< 0.83	U		5.0	< 0.83	U		5.0	< 17	U		100	< 0.83	U		5.0
Benzene	ug/l	5		< 0.41	U		1.0	< 0.41	U		1.0	25			20	1.0			1.0
Carbon tetrachloride	ug/l	5		< 0.27	U		1.0	< 0.27	U		1.0	< 5.4	U		20	< 0.27	U		1.0
Chloroform	ug/l	80		< 0.34	U		1.0	< 0.34	U		1.0	< 6.8	U		20	< 0.34	U		1.0
cis-1,2-Dichloroethene	ug/l	70		< 0.81	U		1.0	< 0.81	U		1.0	< 16	U		20	< 0.81	U		1.0
Ethyl Methacrylate	ug/l	260		< 0.59	U		1.0	< 0.59	U		1.0	< 12	U		20	< 0.59	U		1.0
Ethylbenzene	ug/l	700		< 0.74	U		1.0	< 0.74	U		1.0	< 15	U		20	< 0.74	U		1.0
Methylene chloride	ug/l	5		0.57	J		1.0	0.53	J		1.0	25			20	0.67	J		1.0
n-Propylbenzene	ug/l	52		< 0.69	U		1.0	< 0.69	U		1.0	33			20	< 0.69	U		1.0
Styrene	ug/l	100		< 0.73	U		1.0	< 0.73	U		1.0	< 15	U		20	< 0.73	U		1.0
Tetrachloroethene	ug/l	5		< 0.36	U		1.0	< 0.36	U		1.0	< 7.2	U		20	< 0.36	U		1.0
Tetrahydrofuran	ug/l	227		< 1.3	U		5.0	< 1.3	U		5.0	1600			100	6.0		U at 6.0	5.0
Toluene	ug/l	1000		< 0.51	U		1.0	< 0.51	U		1.0	< 10	U		20	< 0.51	U		1.0
Trichloroethene	ug/l	5		< 0.46	U		1.0	< 0.46	U		1.0	< 9.2	U		20	< 0.46	U		1.0
Vinyl Chloride	ug/l	2		< 0.90	U		1.0	< 0.90	U		1.0	< 18	U		20	< 0.90	U		1.0
Xylenes, Total	ug/l	10000		< 0.66	U		2.0	< 0.66	U		2.0	160			40	< 0.66	U		2.0
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		< 0.40	U		5.0	< 0.40	U		5.0	< 2.0	U		25	< 0.40	U		5.0
2-Toluidine	ug/l	0.2		< 1.5	U		10	< 1.5	U		10	14	J		50	< 1.5	U		10
3-Methylphenol and 4-Methylphenol	ug/l	470		< 0.36	U		10	< 0.36	U		10	< 1.8	U		50	< 0.36	U		10
bis(2-Ethylhexyl) phthalate	ug/l	6		< 2.2	U		5.0	< 2.2	U		5.0	< 11	U		25	< 2.2	U		5.0
Naphthalene	ug/l	100		< 0.76	U		5.0	< 0.76	U		5.0	< 3.8	U		25	< 0.76	U		5.0
N-Nitroso-di-n-butylamine	ug/l	0.003		< 0.60	U		10	< 0.60	U		10	< 3.0	U		50	< 0.60	U		10
N-Nitrosopyrrolidine	ug/l	0.03		< 2.5	U		10	< 2.5	U		10	< 13	U		50	< 2.5	U		10
Phenol	ug/l	2000		< 0.39	U		5.0	< 0.39	U		5.0	< 2.0	U		25	< 0.39	U		5.0
Pyridine	ug/l	9		0.71	J		25	0.54	J		25	< 2.1	U		130	0.64	J		25

Notes:
"---" = No performance standard applicable
"F1" = MS and/or MSD Recovery is outside acceptance limits.
"H" = Sample was prepped or analyzed beyond the specified holding time
"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the MDL (see validation narrative for rationale), estimated value provided.
"J+" = Estimated J value with a possible high bias
"J-" = Estimated J value with a possible low bias
"U" = Compound not detected above method detection limit, quantitation limit provided
"UJ" = The analyte was not detected above the MDL, quantitation limit provided. However, the reported quantitation limit is approximate
"UJ-" = Estimated non-detect with possible low bias
"UH" = Compound not detected above method detection limit, quantitation limit provided. However, Sample was prepped or analyzed beyond the specified holding time.
"JH" = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. However, Sample was prepped or analyzed beyond the specified holding time
"F2J" = MS/MSD RPD exceeds control limits. However, Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
µS/cm = microsiemens per centimenter
Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Downgradient Groundwater Area Including GSA															
			Sample ID	MW-11S				MW-13D				MW-14				MW-17D			
			Date	10/09/2018				10/09/2018				10/11/2018				10/09/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		1.32				0.81				0.76				0.39			
Iron, Ferrous	ug/l	---		2				5.5				2.0				0			
Nitrate-N	mg/l	---		0.037	JH	J-	0.050	< 0.020	UH	UJ-	0.050	0.036	J		0.050	< 0.020	UH	UJ-	0.050
Oxidation Reduction Potential	mV	---		-86.3				-12.9				24.9				98.0			
pH	S.U.	---		6.59				6.72				6.89				6.78			
Specific Conductivity	MS/CM	---		1128				606				370				14.03			
Sulfate as SO4	mg/l	---		21.6			5.0	30.5			5.0	36.8			10.0	13.4			5.0
Temperature	deg c	---		14.93				16.01				12.92				14.03			
Turbidity	NTU	---		3.71				8.71				2.83				0.59			
Metals																			
Arsenic	ug/l	10		574			1.0	101			1.0	21.2			1.0	16.7			1.0
Arsenic, Dissolved	ug/l	10		522			1.0	97.3			1.0	23.1			1.0	13.4			1.0
Manganese	ug/l	300		5670			3.0	1690			3.0	294	B		3.0	1130			3.0
Manganese, Dissolved	ug/l	300		5000	^ B	J+	3.0	1490	^ B	J+	3.0	222			3.0	976	^ B	J+	3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		7.5			1.0	3.9			1.0	1.7			1.0	0.47	J		1.0
TOC Result 2	mg/l	---		7.5			1.0	3.8			1.0	1.7			1.0	< 0.43	U		1.0
Total Organic Carbon	mg/l	---		7.5			1.0	3.9			1.0	1.7			1.0	0.44	J		1.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 0.82	U		1.0	< 0.82	U		1.0	< 0.82	U		1.0	< 0.82	U		1.0
1,1,2-Trichloroethane	ug/l	5		< 0.23	U		1.0	< 0.23	U		1.0	< 0.23	U		1.0	< 0.23	U		1.0
1,1-Dichloroethane	ug/l	360		< 0.38	U		1.0	< 0.38	U		1.0	2.0			1.0	2.7			1.0
1,1-Dichloroethene	ug/l	7		< 0.29	U		1.0	< 0.29	U		1.0	< 0.29	U		1.0	< 0.29	U		1.0
1,2-Dichloroethane	ug/l	5		< 0.21	U		1.0	< 0.21	U		1.0	< 0.21	U		1.0	< 0.21	U		1.0
1,2-Dichloroethene (Total)	ug/l	---		< 0.81	U		2.0	< 0.81	U		2.0	1.0	J		2.0	< 0.81	U		2.0
1,2-Dichloropropane	ug/l	5		< 0.72	U		1.0	< 0.72	U		1.0	< 0.72	U		1.0	< 0.72	U		1.0
1,4-Dichlorobenzene	ug/l	75		< 0.84	U		1.0	< 0.84	U		1.0	< 0.84	U		1.0	< 0.84	U		1.0
1,4-Dioxane	ug/l	4		17			16	6.5			1.6	3.5			1.6	4.8			1.6
2-Butanone	ug/l	4000		< 1.3	U		10	< 1.3	U		10	< 1.3	U		10	< 1.3	U		10
4-Methyl-2-pentanone	ug/l	800		< 2.1	U		5.0	< 2.1	U		5.0	< 2.1	U		5.0	< 2.1	U		5.0
Acetone	ug/l	5600		7.2	J	U at RL	10	< 3.0	U		10	< 3.0	U		10	< 3.0	U		10
Acrylonitrile	ug/l	0.05		< 0.83	U		5.0	< 0.83	U		5.0	< 0.83	U		5.0	< 0.83	U		5.0
Benzene	ug/l	5		< 0.41	U		1.0	< 0.41	U		1.0	< 0.41	U		1.0	< 0.41	U		1.0
Carbon tetrachloride	ug/l	5		< 0.27	U		1.0	< 0.27	U		1.0	< 0.27	U		1.0	< 0.27	U		1.0
Chloroform	ug/l	80		< 0.34	U		1.0	< 0.34	U		1.0	< 0.34	U		1.0	< 0.34	U		1.0
cis-1,2-Dichloroethene	ug/l	70		< 0.81	U		1.0	< 0.81	U		1.0	1.0			1.0	< 0.81	U		1.0
Ethyl Methacrylate	ug/l	260		< 0.59	U		1.0	< 0.59	U		1.0	< 0.59	U		1.0	< 0.59	U		1.0
Ethylbenzene	ug/l	700		< 0.74	U		1.0	< 0.74	U		1.0	< 0.74	U		1.0	< 0.74	U		1.0
Methylene chloride	ug/l	5		0.48	J		1.0	0.66	J		1.0	< 0.44	U		1.0	0.50	J		1.0
n-Propylbenzene	ug/l	52		< 0.69	U		1.0	< 0.69	U		1.0	< 0.69	U		1.0	< 0.69	U		1.0
Styrene	ug/l	100		< 0.73	U		1.0	< 0.73	U		1.0	< 0.73	U		1.0	< 0.73	U		1.0
Tetrachloroethene	ug/l	5		< 0.36	U		1.0	< 0.36	U		1.0	< 0.36	U		1.0	< 0.36	U		1.0
Tetrahydrofuran	ug/l	227		< 1.3	U		5.0	1.6	J	U at RL	5.0	< 1.3	U		5.0	< 1.3	U		5.0
Toluene	ug/l	1000		< 0.51	U		1.0	< 0.51	U		1.0	< 0.51	U		1.0	< 0.51	U		1.0
Trichloroethene	ug/l	5		< 0.46	U		1.0	< 0.46	U		1.0	0.83	J		1.0	< 0.46	U		1.0
Vinyl Chloride	ug/l	2		< 0.90	U		1.0	< 0.90	U		1.0	< 0.90	U		1.0	< 0.90	U		1.0
Xylenes, Total	ug/l	10000		< 0.66	U		2.0	< 0.66	U		2.0	< 0.66	U		2.0	< 0.66	U		2.0
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		< 0.40	U		5.0	< 0.40	UH	UJ-	5.0	< 0.40	U		5.0	< 0.40	U		5.0
2-Toluidine	ug/l	0.2		< 1.5	U		10	< 1.5	UH	UJ-	10	< 1.5	U		10	< 1.5	U		10
3-Methylphenol and 4-Methylphenol	ug/l	470		< 0.36	U		10	< 0.36	UH	UJ-	10	< 0.36	U		10	< 0.36	U		10
bis(2-Ethylhexyl) phthalate	ug/l	6		< 2.2	U		5.0	< 2.2	UH	UJ-	5.0	< 2.2	U		5.0	< 2.2	U		5.0
Naphthalene	ug/l	100		< 0.76	U		5.0	< 0.76	UH	UJ-	5.0	< 0.76	U		5.0	< 0.76	U		5.0
N-Nitroso-di-n-butylamine	ug/l	0.003		< 0.60	U		10	< 0.60	UH	UJ-	10	< 0.60	U		10	< 0.60	U		10
N-Nitrosopyrrolidine	ug/l	0.03		< 2.5	U		10	< 2.5	UH	UJ-	10	< 2.5	U		10	< 2.5	U		10
Phenol	ug/l	2000		< 0.39	U		5.0	< 0.39	UH	UJ-	5.0	< 0.39	U		5.0	< 0.39	U		5.0
Pyridine	ug/l	9		0.78	J		25	0.63	JH		25	0.87	J		25	0.85	J		25

Notes:
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"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
µS/cm = microsiemens per centimenter
Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Downgradient Groundwater Area				Northern Landfill Lobe											
			Sample ID	MW-24M				GP-3				GP-5R				GP-7			
			Date	10/09/2018				10/11/2018				10/11/2018				10/10/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		0.79				3.15				2.95				5.32			
Iron, Ferrous	ug/l	---		0				2.5				4.0				3.0			
Nitrate-N	mg/l	---		19.8			0.050	0.060			0.050	< 0.020	U		0.050	< 0.020	U		0.050
Oxidation Reduction Potential	mV	---		160.6				21.6				-45.7				-72.3			
pH	S.U.	---		5.31				6.24				6.46				6.63			
Specific Conductivity	MS/CM	---		375				1746				2248				4093			
Sulfate as SO4	mg/l	---		14.4			5.0	278			100	29.1			5.0	35.4			10.0
Temperature	deg c	---		15.11				16.31				14.40				14.39			
Turbidity	NTU	---		0.88				8.9				14.3				2.09			
Metals																			
Arsenic	ug/l	10		0.50	J		1.0	60.2			1.0	277			1.0	608			1.0
Arsenic, Dissolved	ug/l	10		0.39	J		1.0	71.0			1.0	313			1.0	498			1.0
Manganese	ug/l	300		589			3.0	906	B		3.0	930	B		3.0	1240			3.0
Manganese, Dissolved	ug/l	300		564	^ B	J+	3.0	850			3.0	822			3.0	1270	^ B	J+	3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		< 0.43	U		1.0	30.8			1.0	40.9			1.0	70.6			1.0
TOC Result 2	mg/l	---		< 0.43	U		1.0	31.2			1.0	40.9			1.0	70.5			1.0
Total Organic Carbon	mg/l	---		< 0.43	U		1.0	31.0			1.0	40.9			1.0	70.6			1.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 0.82	U		1.0	< 4.1	U		5.0	< 6.6	U		8.0	< 3.3	U		4.0
1,1,2-Trichloroethane	ug/l	5		< 0.23	U		1.0	< 1.2	U		5.0	< 1.8	U		8.0	< 0.92	U		4.0
1,1-Dichloroethane	ug/l	360		< 0.38	U		1.0	< 1.9	U		5.0	< 3.0	U		8.0	< 1.5	U		4.0
1,1-Dichloroethene	ug/l	7		< 0.29	U		1.0	< 1.5	U		5.0	< 2.3	U		8.0	< 1.2	U		4.0
1,2-Dichloroethane	ug/l	5		< 0.21	U		1.0	< 1.1	U		5.0	< 1.7	U		8.0	< 0.84	U		4.0
1,2-Dichloroethene (Total)	ug/l	---		< 0.81	U		2.0	< 4.1	U		10	< 6.5	U		16	< 3.2	U		8.0
1,2-Dichloropropane	ug/l	5		< 0.72	U		1.0	< 3.6	U		5.0	< 5.8	U		8.0	< 2.9	U		4.0
1,4-Dichlorobenzene	ug/l	75		< 0.84	U		1.0	< 4.2	U		5.0	< 6.7	U		8.0	< 3.4	U		4.0
1,4-Dioxane	ug/l	4		< 0.61	U		1.6	180			16	89			16	230			32
2-Butanone	ug/l	4000		< 1.3	U		10	< 6.6	U		50	< 11	U		80	< 5.3	U		40
4-Methyl-2-pentanone	ug/l	800		< 2.1	U		5.0	< 11	U		25	< 17	U		40	< 8.4	U		20
Acetone	ug/l	5600		< 3.0	U		10	< 15	U		50	< 24	U		80	< 12	U		40
Acrylonitrile	ug/l	0.05		< 0.83	U		5.0	< 4.2	U		25	< 6.6	U		40	< 3.3	U		20
Benzene	ug/l	5		< 0.41	U		1.0	< 2.1	U		5.0	4.8	J		8.0	2.1	J		4.0
Carbon tetrachloride	ug/l	5		< 0.27	U		1.0	< 1.4	U		5.0	< 2.2	U		8.0	< 1.1	U		4.0
Chloroform	ug/l	80		< 0.34	U		1.0	< 1.7	U		5.0	< 2.7	U		8.0	< 1.4	U		4.0
cis-1,2-Dichloroethene	ug/l	70		< 0.81	U		1.0	< 4.1	U		5.0	< 6.5	U		8.0	< 3.2	U		4.0
Ethyl Methacrylate	ug/l	260		< 0.59	U		1.0	< 3.0	U		5.0	< 4.7	U		8.0	< 2.4	U		4.0
Ethylbenzene	ug/l	700		< 0.74	U		1.0	< 3.7	U		5.0	< 5.9	U		8.0	< 3.0	U		4.0
Methylene chloride	ug/l	5		0.52	J		1.0	< 2.2	U		5.0	< 3.5	U		8.0	< 1.8	U		4.0
n-Propylbenzene	ug/l	52		< 0.69	U		1.0	< 3.5	U		5.0	< 5.5	U		8.0	< 2.8	U		4.0
Styrene	ug/l	100		< 0.73	U		1.0	< 3.7	U		5.0	< 5.8	U		8.0	< 2.9	U		4.0
Tetrachloroethene	ug/l	5		< 0.36	U		1.0	< 1.8	U		5.0	< 2.9	U		8.0	< 1.4	U		4.0
Tetrahydrofuran	ug/l	227		< 1.3	U		5.0	44			25	110			40	90			20
Toluene	ug/l	1000		< 0.51	U		1.0	< 2.6	U		5.0	< 4.1	U		8.0	< 2.0	U		4.0
Trichloroethene	ug/l	5		< 0.46	U		1.0	< 2.3	U		5.0	< 3.7	U		8.0	< 1.8	U		4.0
Vinyl Chloride	ug/l	2		< 0.90	U		1.0	< 4.5	U		5.0	< 7.2	U		8.0	< 3.6	U		4.0
Xylenes, Total	ug/l	10000		< 0.66	U		2.0	< 3.3	U		10	< 5.3	U		16	< 2.6	U		8.0
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		< 0.40	U		5.0	< 2.0	U		25	< 2.0	U		25	< 2.0	U		25
2-Toluidine	ug/l	0.2		< 1.5	U		10	8.7	J		50	< 7.4	U		50	< 7.4	U		50
3-Methylphenol and 4-Methylphenol	ug/l	470		< 0.36	U		10	< 1.8	U		50	< 1.8	U		50	< 1.8	U		50
bis(2-Ethylhexyl) phthalate	ug/l	6		< 2.2	U		5.0	< 11	U		25	< 11	U		25	< 11	U		25
Naphthalene	ug/l	100		< 0.76	U		5.0	< 3.8	U		25	< 3.8	U		25	11	J		25
N-Nitroso-di-n-butylamine	ug/l	0.003		< 0.60	U		10	< 3.0	U		50	< 3.0	U		50	< 3.0	U		50
N-Nitrosopyrrolidine	ug/l	0.03		< 2.5	U		10	< 13	U		50	< 13	U		50	< 13	U		50
Phenol	ug/l	2000		< 0.39	U		5.0	< 2.0	U		25	< 2.0	U		25	< 2.0	U		25
Pyridine	ug/l	9		0.55	J		25	< 2.1	U		130	< 2.1	U		130	< 2.1	U		130

Notes:
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"J+" = Estimated J value with a possible high bias
"J-" = Estimated J value with a possible low bias
"U" = Compound not detected above method detection limit, quantitation limit provided
"UJ" = The analyte was not detected above the MDL, quantitation limit provided. However, the reported quantitation limit is approximate
"UJ-" = Estimated non-detect with possible low bias
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"F2J" = MS/MSD RPD exceeds control limits. However, Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
µS/cm = microsiemens per centimenter
Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Northern Landfill Lobe															
			Sample ID	MW-2SR				MW-7S				MW-8M				MW-9			
			Date	10/10/2018				10/10/2018				10/09/2018				10/10/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		1.23				2.04				2.90				2.27			
Iron, Ferrous	ug/l	---		4.5				3.0				3.0				2.0			
Nitrate-N	mg/l	---		0.087			0.050	0.044	JH	J-	0.050	< 0.020	U		0.050	0.10	H	J-	0.050
Oxidation Reduction Potential	mV	---		-94.5				-33.7				-76.5				-74.8			
pH	S.U.	---		6.83				6.33				6.68				6.37			
Specific Conductivity	MS/CM	---		712				788				3425				1354			
Sulfate as SO4	mg/l	---		110			25.0	53.8			10.0	< 1.4	U		5.0	19.0			5.0
Temperature	deg c	---		15.57				17.96				15.18				14.66			
Turbidity	NTU	---		12.8				17.9				4.46				9.81			
Metals																			
Arsenic	ug/l	10		476			1.0	52.7			1.0	1070			1.0	425			1.0
Arsenic, Dissolved	ug/l	10		498			1.0	62.7			1.0	972			1.0	446			1.0
Manganese	ug/l	300		2170			3.0	4750			3.0	949			3.0	8460			3.0
Manganese, Dissolved	ug/l	300		2130	^ B	J+	3.0	4810	^ B	J+	3.0	875	^ B	J+	3.0	8320	^ B	J+	3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		10.2			1.0	7.1			1.0	53.8			1.0	105			4.0
TOC Result 2	mg/l	---		10.3			1.0	7.2			1.0	53.3			1.0	106			4.0
Total Organic Carbon	mg/l	---		10.3			1.0	7.2			1.0	53.6			1.0	105			4.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 3.3	U		4.0	< 1.6	U		2.0	< 6.6	U		8.0	< 820	U		1000
1,1,2-Trichloroethane	ug/l	5		< 0.92	U		4.0	< 0.46	U		2.0	< 1.8	U		8.0	< 230	U		1000
1,1-Dichloroethane	ug/l	360		< 1.5	U		4.0	76			2.0	< 3.0	U		8.0	< 380	U		1000
1,1-Dichloroethene	ug/l	7		< 1.2	U		4.0	6.9			2.0	< 2.3	U		8.0	< 290	U		1000
1,2-Dichloroethane	ug/l	5		< 0.84	U		4.0	1.4	J		2.0	< 1.7	U		8.0	< 210	U		1000
1,2-Dichloroethene (Total)	ug/l	---		< 3.2	U		8.0	5.4			4.0	< 6.5	U		16	< 810	U		2000
1,2-Dichloropropane	ug/l	5		< 2.9	U		4.0	< 1.4	U		2.0	< 5.8	U		8.0	< 720	U		1000
1,4-Dichlorobenzene	ug/l	75		< 3.4	U		4.0	< 1.7	U		2.0	< 6.7	U		8.0	< 840	U		1000
1,4-Dioxane	ug/l	4		< 0.61	U		1.6	79			6.4	200			32	380			32
2-Butanone	ug/l	4000		< 5.3	U		40	< 2.6	U		20	< 11	U		80	9400	J		10000
4-Methyl-2-pentanone	ug/l	800		< 8.4	U		20	< 4.2	U		10	< 17	U		40	27000			5000
Acetone	ug/l	5600		< 12	U		40	6.3	J		20	< 24	U		80	14000			10000
Acrylonitrile	ug/l	0.05		< 3.3	U		20	< 1.7	U		10	< 6.6	U		40	< 830	U		5000
Benzene	ug/l	5		< 1.6	U		4.0	1.4	J		2.0	3.4	J		8.0	< 410	U		1000
Carbon tetrachloride	ug/l	5		< 1.1	U		4.0	< 0.54	U		2.0	< 2.2	U		8.0	< 270	U		1000
Chloroform	ug/l	80		< 1.4	U		4.0	< 0.68	U		2.0	< 2.7	U		8.0	< 340	U		1000
cis-1,2-Dichloroethene	ug/l	70		< 3.2	U		4.0	5.4			2.0	< 6.5	U		8.0	< 810	U		1000
Ethyl Methacrylate	ug/l	260		< 2.4	U		4.0	< 1.2	U		2.0	< 4.7	U		8.0	< 590	U		1000
Ethylbenzene	ug/l	700		< 3.0	U		4.0	< 1.5	U		2.0	40			8.0	4000			1000
Methylene chloride	ug/l	5		< 1.8	U		4.0	< 0.88	U		2.0	12			8.0	< 440	U		1000
n-Propylbenzene	ug/l	52		< 2.8	U		4.0	< 1.4	U		2.0	6.2	J		8.0	< 690	U		1000
Styrene	ug/l	100		< 2.9	U		4.0	< 1.5	U		2.0	< 5.8	U		8.0	< 730	U		1000
Tetrachloroethene	ug/l	5		< 1.4	U		4.0	< 0.72	U		2.0	< 2.9	U		8.0	< 360	U		1000
Tetrahydrofuran	ug/l	227		< 5.0	U		20	< 2.5	U		10	97			40	7000			5000
Toluene	ug/l	1000		< 2.0	U		4.0	< 1.0	U		2.0	5.9	J		8.0	40000			1000
Trichloroethene	ug/l	5		< 1.8	U		4.0	3.2			2.0	< 3.7	U		8.0	< 460	U		1000
Vinyl Chloride	ug/l	2		< 3.6	U		4.0	< 1.8	U		2.0	< 7.2	U		8.0	< 900	U		1000
Xylenes, Total	ug/l	10000		< 2.6	U		8.0	< 1.3	U		4.0	110			16	18000			2000
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		< 2.0	U		25	< 2.0	U		25	< 4.0	U		50	230	J	J	250
2-Toluidine	ug/l	0.2		< 7.4	U		50	< 7.4	U		50	< 15	U		100	< 74	U	J	500
3-Methylphenol and 4-Methylphenol	ug/l	470		< 1.8	U		50	< 1.8	U		50	< 3.6	U		100	560		J	500
bis(2-Ethylhexyl) phthalate	ug/l	6		< 11	U		25	< 11	U		25	< 22	U		50	< 110	U	J	250
Naphthalene	ug/l	100		< 3.8	U		25	< 3.8	U		25	< 7.6	U		50	< 38	U	J	250
N-Nitroso-di-n-butylamine	ug/l	0.003		< 3.0	U		50	< 3.0	U		50	< 6.0	U		100	< 30	U	J	500
N-Nitrosopyrrolidine	ug/l	0.03		< 13	U		50	< 13	U		50	< 25	U		100	< 130	U	J	500
Phenol	ug/l	2000		< 2.0	U		25	< 2.0	U		25	< 3.9	U		50	430		J	250
Pyridine	ug/l	9		< 2.1	U		130	< 2.1	U		130	< 4.1	U		250	< 21	U	J	1300

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deg C = Degrees in celcius
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S.U. = standard units for potential hydrogen (pH)
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Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

			Group	Southern Landfill Lobe															
			Sample ID	GP-16				GP-18				GP-21				MW-4B			
			Date	10/10/2018				10/10/2018				10/10/2018				10/10/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)		Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE																			
Dissolved Oxygen	mg/l	---		0.06				7.10				0.98				0.06			
Iron, Ferrous	ug/l	---		7.0				7.0				6.0				6.5			
Nitrate-N	mg/l	---		0.090	H	J-	0.050	0.035	J		0.050	0.079	H	J-	0.050	0.045	JH	J-	0.050
Oxidation Reduction Potential	mV	---		-55.1				-79.4				-39.8				-59.7			
pH	S.U.	---		6.02				6.53				6.37				6.07			
Specific Conductivity	MS/CM	---		903				9				779				2907			
Sulfate as SO4	mg/l	---		< 1.4	U		5.0	< 1.4	U		5.0	< 1.4	U		5.0	< 1.4	U		5.0
Temperature	deg c	---		15.99				17.58				13.65				14.89			
Turbidity	NTU	---		34.4				4.25				2.35				1.64			
Metals																			
Arsenic	ug/l	10		709			1.0	601			1.0	308			1.0	546			1.0
Arsenic, Dissolved	ug/l	10		758			1.0	687			1.0	363			1.0	628			1.0
Manganese	ug/l	300		908	B		3.0	437	B		3.0	575	B		3.0	98.9	B		3.0
Manganese, Dissolved	ug/l	300		449	^ B	J+	3.0	422	^ B	J+	3.0	542	^ B	J+	3.0	96.2	^ B	J+	3.0
Total Organic Carbon																			
TOC Result 1	mg/l	---		84.8			1.0	14.5			1.0	20.1			1.0	88.3			1.0
TOC Result 2	mg/l	---		84.3			1.0	14.8			1.0	20.7			1.0	85.4			1.0
Total Organic Carbon	mg/l	---		84.6			1.0	14.6			1.0	20.4			1.0	86.9			1.0
Volatile Organic Compounds																			
1,1,1-Trichloroethane	ug/l	200		< 16	U		20	< 1.6	U		2.0	< 1.6	U		2.0	< 82	U		100
1,1,2-Trichloroethane	ug/l	5		< 4.6	U		20	< 0.46	U		2.0	< 0.46	U		2.0	< 23	U		100
1,1-Dichloroethane	ug/l	360		< 7.6	U		20	< 0.76	U		2.0	< 0.76	U		2.0	< 38	U		100
1,1-Dichloroethene	ug/l	7		< 5.8	U		20	< 0.58	U		2.0	< 0.58	U		2.0	< 29	U		100
1,2-Dichloroethane	ug/l	5		< 4.2	U		20	< 0.42	U		2.0	0.43	J		2.0	< 21	U		100
1,2-Dichloroethene (Total)	ug/l	---		22	J		40	< 1.6	U		4.0	< 1.6	U		4.0	< 81	U		200
1,2-Dichloropropane	ug/l	5		< 14	U		20	< 1.4	U		2.0	< 1.4	U		2.0	< 72	U		100
1,4-Dichlorobenzene	ug/l	75		28			20	< 1.7	U		2.0	< 1.7	U		2.0	< 84	U		100
1,4-Dioxane	ug/l	4		22			16	65			16	23			1.6	680			40
2-Butanone	ug/l	4000		120	J		200	< 2.6	U		20	< 2.6	U		20	< 130	U		1000
4-Methyl-2-pentanone	ug/l	800		260			100	< 4.2	U		10	< 4.2	U		10	< 210	U		500
Acetone	ug/l	5600		190	J		200	< 6.0	U		20	7.7	J		20	< 300	U		1000
Acrylonitrile	ug/l	0.05		< 17	U		100	< 1.7	U		10	< 1.7	U		10	< 83	U		500
Benzene	ug/l	5		8.9	J		20	< 0.82	U		2.0	3.3			2.0	< 41	U		100
Carbon tetrachloride	ug/l	5		< 5.4	U		20	< 0.54	U		2.0	< 0.54	U		2.0	< 27	U		100
Chloroform	ug/l	80		< 6.8	U		20	< 0.68	U		2.0	< 0.68	U		2.0	< 34	U		100
cis-1,2-Dichloroethene	ug/l	70		22			20	< 1.6	U		2.0	< 1.6	U		2.0	< 81	U		100
Ethyl Methacrylate	ug/l	260		< 12	U		20	< 1.2	U		2.0	< 1.2	U		2.0	< 59	U		100
Ethylbenzene	ug/l	700		130			20	< 1.5	U		2.0	< 1.5	U		2.0	310			100
Methylene chloride	ug/l	5		< 8.8	U		20	< 0.88	U		2.0	< 0.88	U		2.0	< 44	U		100
n-Propylbenzene	ug/l	52		< 14	U		20	< 1.4	U		2.0	5.7			2.0	< 69	U		100
Styrene	ug/l	100		< 15	U		20	< 1.5	U		2.0	< 1.5	U		2.0	< 73	U		100
Tetrachloroethene	ug/l	5		< 7.2	U		20	< 0.72	U		2.0	< 0.72	U		2.0	< 36	U		100
Tetrahydrofuran	ug/l	227		110			100	23			10	200			10	9400			500
Toluene	ug/l	1000		950			20	< 1.0	U		2.0	< 1.0	U		2.0	< 51	U		100
Trichloroethene	ug/l	5		< 9.2	U		20	< 0.92	U		2.0	< 0.92	U		2.0	< 46	U		100
Vinyl Chloride	ug/l	2		< 18	U		20	< 1.8	U		2.0	< 1.8	U		2.0	< 90	U		100
Xylenes, Total	ug/l	10000		480			40	2.2	J		4.0	71			4.0	800			200
Semi-Volatile Organic Compounds																			
2-Methylphenol	ug/l	540		13	J		25	< 0.40	U		5.0	< 0.40	U		5.0	< 8.0	U		100
2-Toluidine	ug/l	0.2		< 7.4	U		50	< 1.5	U		10	< 1.5	U		10	< 30	U		200
3-Methylphenol and 4-Methylphenol	ug/l	470		560			500	< 0.36	U		10	< 0.36	U		10	< 7.2	U		200
bis(2-Ethylhexyl) phthalate	ug/l	6		< 11	U		25	< 2.2	U		5.0	< 2.2	U		5.0	< 44	U		100
Naphthalene	ug/l	100		4.5	J		25	< 0.76	U		5.0	< 0.76	U		5.0	< 15	U		100
N-Nitroso-di-n-butylamine	ug/l	0.003		< 3.0	U		50	< 0.60	U		10	< 0.60	U		10	< 12	U		200
N-Nitrosopyrrolidine	ug/l	0.03		< 13	U		50	< 2.5	U		10	< 2.5	U		10	< 50	U		200
Phenol	ug/l	2000		26			25	< 0.39	U		5.0	< 0.39	U		5.0	< 7.8	U		100
Pyridine	ug/l	9		< 2.1	U		130	0.72	J		25	0.63	J		25	< 8.2	U		500

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"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the MDL (see validation narrative for rationale), estimated value provided.
"J+" = Estimated J value with a possible high bias
"J-" = Estimated J value with a possible low bias
"U" = Compound not detected above method detection limit, quantitation limit provided
"UJ" = The analyte was not detected above the MDL, quantitation limit provided. However, the reported quantitation limit is approximate
"UJ-" = Estimated non-detect with possible low bias
"UH" = Compound not detected above method detection limit, quantitation limit provided. However, Sample was prepped or analyzed beyond the specified holding time.
"JH" = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. However, Sample was prepped or analyzed beyond the specified holding time
"F2J" = MS/MSD RPD exceeds control limits. However, Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
µS/cm = microsiemens per centimenter
Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Table 2
Groundwater Monitoring Results - October 2018
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

		Group	Southern Landfill Lobe							
		Sample ID	MW-4S				MW-110			
		Date	10/10/2018				10/11/2018			
Parameter	Units	Groundwater Performance Standards (ug/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL
FIELD MEASURE										
Dissolved Oxygen	mg/l	---	0.06				3.05			
Iron, Ferrous	ug/l	---	7.0				2.5			
Nitrate-N	mg/l	---	0.056	H	J-	0.050	7.1			0.050
Oxidation Reduction Potential	mV	---	-47.3				-87.4			
pH	S.U.	---	5.84				6.71			
Specific Conductivity	MS/CM	---	2492				2883			
Sulfate as SO4	mg/l	---	< 1.4	U		5.0	< 1.4	U		5.0
Temperature	deg c	---	16.01				15.53			
Turbidity	NTU	---	10.6				133			
Metals										
Arsenic	ug/l	10	82.0			1.0	89.1			1.0
Arsenic, Dissolved	ug/l	10	87.3			1.0	65.6			1.0
Manganese	ug/l	300	115	B		3.0	151	B		3.0
Manganese, Dissolved	ug/l	300	109	B		15.0	1130			3.0
Total Organic Carbon										
TOC Result 1	mg/l	---	60.5			1.0	83.3			1.0
TOC Result 2	mg/l	---	59.3			1.0	82.0			1.0
Total Organic Carbon	mg/l	---	59.9			1.0	82.6			1.0
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/l	200	< 16	U		20	< 16	U		20
1,1,2-Trichloroethane	ug/l	5	< 4.6	U		20	< 4.6	U		20
1,1-Dichloroethane	ug/l	360	< 7.6	U		20	< 7.6	U		20
1,1-Dichloroethene	ug/l	7	< 5.8	U		20	< 5.8	U		20
1,2-Dichloroethane	ug/l	5	< 4.2	U		20	< 4.2	U		20
1,2-Dichloroethene (Total)	ug/l	---	< 16	U		40	< 16	U		40
1,2-Dichloropropane	ug/l	5	< 14	U		20	< 14	U		20
1,4-Dichlorobenzene	ug/l	75	< 17	U		20	< 17	U		20
1,4-Dioxane	ug/l	4	110			16	390			16
2-Butanone	ug/l	4000	< 26	U		200	< 26	U		200
4-Methyl-2-pentanone	ug/l	800	< 42	U		100	< 42	U		100
Acetone	ug/l	5600	< 60	U		200	< 60	U		200
Acrylonitrile	ug/l	0.05	< 17	U		100	< 17	U		100
Benzene	ug/l	5	19	J		20	< 8.2	U		20
Carbon tetrachloride	ug/l	5	< 5.4	U		20	< 5.4	U		20
Chloroform	ug/l	80	< 6.8	U		20	< 6.8	U		20
cis-1,2-Dichloroethene	ug/l	70	< 16	U		20	< 16	U		20
Ethyl Methacrylate	ug/l	260	< 12	U		20	< 12	U		20
Ethylbenzene	ug/l	700	160			20	31			20
Methylene chloride	ug/l	5	< 8.8	U		20	< 8.8	U		20
n-Propylbenzene	ug/l	52	< 14	U		20	< 14	U		20
Styrene	ug/l	100	< 15	U		20	< 15	U		20
Tetrachloroethene	ug/l	5	< 7.2	U		20	< 7.2	U		20
Tetrahydrofuran	ug/l	227	760			100	2500			100
Toluene	ug/l	1000	< 10	U		20	< 10	U		20
Trichloroethene	ug/l	5	< 9.2	U		20	< 9.2	U		20
Vinyl Chloride	ug/l	2	< 18	U		20	< 18	U		20
Xylenes, Total	ug/l	10000	470			40	97			40
Semi-Volatile Organic Compounds										
2-Methylphenol	ug/l	540	< 8.0	U		100	< 8.0	U		100
2-Toluidine	ug/l	0.2	< 30	U		200	< 30	U		200
3-Methylphenol and 4-Methylphenol	ug/l	470	9.2	J		200	< 7.2	U		200
bis(2-Ethylhexyl) phthalate	ug/l	6	< 44	U		100	< 44	U		100
Naphthalene	ug/l	100	< 15	U		100	< 15	U		100
N-Nitroso-di-n-butylamine	ug/l	0.003	< 12	U		200	< 12	U		200
N-Nitrosopyrrolidine	ug/l	0.03	< 50	U		200	< 50	U		200
Phenol	ug/l	2000	< 7.8	U		100	< 7.8	U		100
Pyridine	ug/l	9	< 8.2	U		500	< 8.2	U		500

Notes:
"---" = No performance standard applicable
"F1" = MS and/or MSD Recovery is outside acceptance limits.
"H" = Sample was prepped or analyzed beyond the specified holding time
"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the MDL (see validation narrative for rationale), estimated value provided.
"J+" = Estimated J value with a possible high bias
"J-" = Estimated J value with a possible low bias
"U" = Compound not detected above method detection limit, quantitation limit provided
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"UJ-" = Estimated non-detect with possible low bias
"UH" = Compound not detected above method detection limit, quantitation limit provided. However, Sample was prepped or analyzed beyond the specified holding time.
"JH" = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. However, Sample was prepped or analyzed beyond the specified holding time
"F2J" = MS/MSD RPD exceeds control limits. However, Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
"RL" = Reporting Limits
"B" = compound was found in the blank and sample.
"B^" = Compound was found in the blank and sample. However, ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
"QL" = Quantitation Limit
"LQual" = Laboratory Qualifier
"VQual" = Validator Qualifier (only noted if different from LQual)
"NA" = Not Applicable
"NM" = Not Measured
µg/L = micrograms per liter
deg C = Degrees in celcius
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mV = millivolts
NTU = Nephelometric turbidity unit
** = YSI 6820 sensor has +/- 2% accuracy (Registered negative values for turbidity should be considered "zero" according to manufacturer of instrument)
S.U. = standard units for potential hydrogen (pH)
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Shading indicated exceedance of Groundwater Performance Standards (µg/L) and may also signify a reporting limit above a Groundwater Performance Standard.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
All other monitoring wells that were planned to be sampled but not shown in this table were either not accessible or destroyed (see gauging table)

Group			Downgradient Groundwater Area Including GSA															
Sample ID / Date			GP-24 2011-09-15				GP-24 2012-03-30				GP-24 2012-09-25				GP-24 2013-03-26			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.71				0.31				NA				0.19			
Iron, Ferrous	mg/l	---	3.7				2.34				NA				1.85			
Oxidation Reduction Potential	mV	---	-86.9				-40.5				NA				-124.4			
pH	SU	---	6.81				6.92				NA				6.9			
Specific Conductance	µs/cm	---	476				63				NA				349			
Temperature	CELSIUS	---	11.01				9.13				NA				9.56			
Turbidity, field	NTU	---	9.53				23.8				NA				3.46			
Metals																		
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1				
Arsenic	µg/l	10	9			1	8.2			1	8.9			1	8.6			1
Arsenic, dissolved	µg/l	10	8.6			1	8.7			1	8.6			1				
Beryllium	µg/l	4	< 0.70	U		0.7	0.033	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7				
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5				
Chromium	µg/l	100	1.2	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	1.1	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004				
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005				
Manganese	µg/l	300	810			0.003	980			0.003	490			0.003	870			0.003
Manganese, dissolved	µg/l	300	800			0.003	980			0.003	490	B		0.003				
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	µg/l	2	0.044	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	0.034	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Zinc	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01	3.6	J		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds	**Semi Volatile Organic Compounds**																	
2-Methylphenol	µg/l	540	< 4.7	U		4.7	0.74	J		4.8	< 4.8	U		4.8	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 4.8	U		4.8
Naphthalene	µg/l	100	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 4.8	U		4.8
N-Nitrosodibutylamine	µg/l	0.003	< 9.4	UJ		9.4	< 9.6	U		9.6	< 9.5	U		9.5	< 9.5	U		9.5
N-Nitrosopyrrolidine	µg/l	0.03	< 9.4	UJ		9.4	< 9.6	U		9.6	< 9.5	U		9.5	< 9.5	U		9.5
o-Toluidine	µg/l	0.2	< 9.4	UJ		9.4	5.6	J		9.6	< 9.5	U		9.5	< 9.5	U		9.5
Phenol	µg/l	2000	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 4.8	U		4.8
Pyridine	µg/l	9	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	0.92	J		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	2.5			1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	3.4			1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	2.9			1.6	3.6			1.6	6.7	J		1.6	21			1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Group			Downgradient Groundwater Area Including GSA															
Sample ID / Date			GP-24 2013-09-24				GP-24 2014-05-06				GP-24 2014-10-31				GP-24 2015-05-08			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	1.1				0.21				0.04				0.16			
Iron, Ferrous	mg/l	---					2.75				3.5				3			
Oxidation Reduction Potential	mV	---	-99				93.5				-114.3				-23.5			
pH	SU	---	9.73				6.52				6.91				6.89			
Specific Conductance	µs/cm	---	359				282				347				340			
Temperature	CELSIUS	---	10.8				9.64				10.5				9.76			
Turbidity, field	NTU	---	1.7				1.9				0.52				2			
Metals																		
Antimony	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	8.5			1					8.9			1	10.4			1
Arsenic, dissolved	µg/l	10	8.5			1					9.1			1	10.3			1
Beryllium	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	0.12	J		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	490			0.003					450			0.003	470	B		0.003
Manganese, dissolved	µg/l	300	490			0.003					450	^		0.003	490			0.003
Selenium	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	1.9	J		0.01					< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000	3	J		0.01					< 10	U		0.01	3.3	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Compounds**																	
2-Methylphenol	µg/l	540	< 3.9	U		3.9	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6
bis(2-Ethylhexyl) phthalate	µg/l	6	< 3.9	U		3.9	5.2			4.8	< 5.0	U		5	< 4.6	U		4.6
Naphthalene	µg/l	100	< 3.9	U		3.9	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6
N-Nitrosodibutylamine	µg/l	0.003	< 7.8	*U		7.8	< 9.6	U		9.6	< 10	U		10	< 9.3	U		9.3
N-Nitrosopyrrolidine	µg/l	0.03	< 7.8	*U		7.8	< 9.6	UJ		9.6	< 10	U		10	< 9.3	U		9.3
o-Toluidine	µg/l	0.2	< 7.8	U		7.8	< 9.6	UJ		9.6	< 10	U		10	< 9.3	U		9.3
Phenol	µg/l	2000	< 3.9	U		3.9	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6
Pyridine	µg/l	9	< 20	U		20	< 24	U		24	< 25	U		25	< 23	U		23
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	38			1.6	9.1	J		1.6	4.2			1.6	2.3			1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	*U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	*U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Group			Downgradient Groundwater Area Including GSA																			
Sample ID / Date			GP-24 2015-10-28				GP-24 2017-03-30				GP-24 2017-06-28				GP-24 2017-08-07				GP-24 2017-10-11			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.08				0.63				0.13				0.41				0.4			
Iron, Ferrous	mg/l	---	1								3.5				2				3.0			
Oxidation Reduction Potential	mV	---	-75.6				-51.8				-68.2				-81.4				-86.8			
pH	SU	---	7.21				7.13				8.3				6.96				6.78			
Specific Conductance	µs/cm	---	82				372				395				335				389			
Temperature	CELSIUS	---	10.02				8.13				11.41				11.48				12.69			
Turbidity, field	NTU	---	2.41				5.27				7.8				4.08				1.19			
Metals																						
Antimony	µg/l	6	< 1.0	U		1																
Antimony, dissolved	µg/l	6	< 1.0	U		1																
Arsenic	µg/l	10	8.2	B		1	9.1			1.0	8.6			1.0	8.3			1.0	8.6			1.0
Arsenic, dissolved	µg/l	10	9.1			1	9.1			1.0	8.4			1.0	9.2			1.0	8.4			1.0
Beryllium	µg/l	4	< 0.70	U		0.7																
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7																
Cadmium	µg/l	5	< 0.50	U		0.5																
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5																
Chromium	µg/l	100	< 4.0	U		0.004																
Chromium, dissolved	µg/l	100	< 4.0	U		0.004																
Lead	µg/l	15	< 5.0	U		0.005																
Lead, dissolved	µg/l	15	< 5.0	U		0.005																
Manganese	µg/l	300	490			0.003	590			0.0030	615			3.0	622	B		3.0	606	B		3.0
Manganese, dissolved	µg/l	300	450	B		0.003	590			0.0030	605			3.0	593	B		3.0	614	B		3.0
Selenium	µg/l	50	< 15	U		0.015																
Selenium, dissolved	µg/l	50	< 15	U		0.015																
Silver	µg/l	100	< 3.0	U		0.003																
Silver, dissolved	µg/l	100	< 3.0	U		0.003																
Thallium	µg/l	2	< 0.20	U		0.2																
Thallium, dissolved	µg/l	2	< 0.20	U		0.2																
Zinc	µg/l	2000	1.5	J		0.01																
Zinc, dissolved	µg/l	2000	2.9	J		0.01																
Semi Volatile Organic Compounds	**Semi Volatile Organic Compounds**																					
2-Methylphenol	µg/l	540	< 5.4	U		5.4													< 5.0	U		5.0
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.4	U		5.4													< 5.0	U		5.0
Naphthalene	µg/l	100	< 5.4	U		5.4													< 5.0	U		5.0
N-Nitrosodibutylamine	µg/l	0.003	< 11	UJ		11													< 10	U		10
N-Nitrosopyrrolidine	µg/l	0.03	< 11	UJ		11													< 10	U		10
o-Toluidine	µg/l	0.2	< 11	UJ		11													< 10	U		10
Phenol	µg/l	2000	< 5.4	U		5.4													< 5.0	U		5.0
Pyridine	µg/l	9	< 27	U		27													< 25	U		25
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dioxane	µg/l	4	1.4	J		1.6	< 1.6	U		1.6	2.0			1.6	3.4			1.6	1.7			1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U	U	10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U	U	10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U	UJ	1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
cis/trans 1,2-Dichloroethene	µg/l	---					< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U	UJ	1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Sample ID / Date			GP-25 2011-09-15				GP-25 2012-03-28				GP-25 2012-09-25				GP-25 2013-03-20				GP-25 2013-09-24			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	7.63				1.06				NA				2.2				0.8			
Iron, Ferrous	mg/l	---	7.5				2.66				NA				2.33				4.1			
Oxidation Reduction Potential	mV	---	-112				-92.6				NA				-133.6				-108			
pH	SU	---	6.69				6.91				NA				6.86				6.81			
Specific Conductance	µs/cm	---	3220				405				NA				3393				3444			
Temperature	CELSIUS	---	10.96				9.12				NA				8.39				10.9			
Turbidity, field	NTU	---	3.5				0.87				NA				1.64				2.7			
Metals																						
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.22	J		1
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1	0.26	J		1					0.17	J		1
Arsenic	µg/l	10	469			1	448			1	890			5	553			1	1180			10
Arsenic, dissolved	µg/l	10	446			1	463			1	862			1					1170			10
Beryllium	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	0.033	J		0.7	0.041	J		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Chromium	µg/l	100	2.5	J		0.004	< 4.0	U		0.004	2.2	J		0.004	1.2	J		0.004	1.8	J		0.004
Chromium, dissolved	µg/l	100	2.3	J		0.004	< 4.0	U		0.004	1.9	J		0.004					2.4	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	3.2	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005
Manganese	µg/l	300	5600			0.003	5700			0.003	3500			0.003	5200			0.003	3600			0.003
Manganese, dissolved	µg/l	300	5400			0.003	5600			0.003	3400	B		0.003					3500			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Thallium	µg/l	2	0.47			0.2	0.26			0.2	0.55			0.2	< 0.20	U		0.2	0.55			0.2
Thallium, dissolved	µg/l	2	0.41			0.2	0.21			0.2	0.51			0.2					0.5			0.2
Zinc	µg/l	2000	< 10	U		0.01	1.5	J		0.01	3	J		0.01	3.3	J		0.01	3.8	J		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					5.9	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																					
2-Methylphenol	µg/l	540	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	0.77	J		5.2	< 3.9	U		3.9
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 5.2	*U		5.2	< 3.9	U		3.9
Naphthalene	µg/l	100	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 5.2	U		5.2	< 3.9	U		3.9
N-Nitrosodibutylamine	µg/l	0.003	< 9.4	UJ		9.4	< 9.7	U		9.7	< 9.5	U		9.5	< 10	U		10	< 7.8	*U		7.8
N-Nitrosopyrrolidine	µg/l	0.03	< 9.4	UJ		9.4	< 9.7	U		9.7	< 9.5	U		9.5	< 10	U		10	< 7.8	*U		7.8
o-Toluidine	µg/l	0.2	< 9.4	UJ		9.4	30			9.7	8.1	J		9.5	22			10	5.6	J		7.8
Phenol	µg/l	2000	< 4.7	U		4.7	< 4.8	U		4.8	< 4.8	U		4.8	< 5.2	U		5.2	< 3.9	U		3.9
Pyridine	µg/l	9	< 24	U		24	< 24	U		24	< 24	U		24	< 26	U		26	< 20	U		20
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	0.9	J		1	1.1			1	< 1.0	U		1	1.2			1	1.3			1
1,4-Dioxane	µg/l	4	49			1.6	75			1.6	83	J		1.6	67	J		8	150	J		8
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	5.8	J		10	10	J		10	< 10	U		10	5.4	J		10	7.5	J		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	2.2			1	2.3			1	0.51	J		1	3			1	2.9			1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	54			5	67			5	2.5	J		5	81			5	71			5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Sample ID / Date	GP-25 2014-05-07				GP-25 2014-10-31				GP-25 2015-05-08				GP-25 2015-10-28			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.25				0.21				0.31				0.29			
Iron, Ferrous	3				1				1.5				2			
Oxidation Reduction Potential	-180.2				-161.1				-77.5				-108.1			
pH	6.77				6.83				6.82				6.77			
Specific Conductance	3402				3812				4034				907			
Temperature	9.91				10.61				9.46				10.38			
Turbidity, field	2.06				1.48				3.1				1.29			
Metals																
Antimony					0.25	J		1	0.32	J		1	0.27	J		1
Antimony, dissolved					0.24	J		1	0.32	J		1	0.27	J		1
Arsenic					751			1	861			1	1720	B		5
Arsenic, dissolved					724			1	889			1	1870			5
Beryllium					< 1.4	U		1.4	0.039	J		0.7	< 0.70	U		0.7
Beryllium, dissolved					< 1.4	U		1.4	0.044	J		0.7	< 0.70	U		0.7
Cadmium					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium					4.9			0.004	2.6	J		0.004	2.4	J		0.004
Chromium, dissolved					1.1	J		0.004	2.9	J		0.004	2.3	J		0.004
Lead	< 5.0	U		0.005	3.3	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese					3700			0.003	5000	B		0.003	3800			0.003
Manganese, dissolved					3700			0.003	5200			0.003	3600	B		0.003
Selenium					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium					0.22			0.2	0.19	J		0.2	0.32			0.2
Thallium, dissolved					< 0.20	U		0.2	< 0.20	U		0.2	0.23			0.2
Zinc					< 10	U		0.01	< 10	U		0.01	3.2	J		0.01
Zinc, dissolved					< 10	U		0.01	2.7	J		0.01	5.7	J		0.01
Semi Volatile Organic Compounds																
2-Methylphenol	< 23	U		23	0.46	J		5	< 23	U		23	< 5.1	U		5.1
bis(2-Ethylhexyl) phthalate	< 23	U		23	< 5.0	U		5	< 23	U		23	< 5.1	U		5.1
Naphthalene	< 23	U		23	< 5.0	U		5	< 23	U		23	< 5.1	U		5.1
N-Nitrosodibutylamine	< 46	UJ		46	< 10	U		10	< 46	U		46	< 10	UJ		10
N-Nitrosopyrrolidine	< 46	UJ		46	11			10	< 46	U		46	< 10	UJ		10
o-Toluidine	< 46	UJ		46	37			10	27	J		46	22	J		10
Phenol	< 23	U		23	< 5.0	U		5	< 23	U		23	< 5.1	U		5.1
Pyridine	< 110	U		110	< 25	U		25	< 120	U		120	< 25	U		25
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,1,2-Trichloroethane	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,1-Dichloroethane	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,1-Dichloroethene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,2-Dichloroethane	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,2-Dichloropropane	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,4-Dichlorobenzene	1.4			1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
1,4-Dioxane	140			8	170			40	530			40	85			32
2-Butanone (MEK)	< 10	U		10	< 40	U		40	< 50	U		50	< 50	U		50
Acetone	11			10	< 40	U		40	< 50	U		50	< 50	U		50
Acrylonitrile	< 5.0	U		5	< 20	U		20	< 25	U		25	< 25	U		25
Benzene	3.1			1	3.1	J		4	3.4	J		5	3.6	J		5
Carbon tetrachloride	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Chloroform	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	< 2.0	U		2	< 8.0	U		8	< 10	U		10	< 10	U		10
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Ethyl benzene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Ethyl methacrylate	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
n-Propylbenzene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Styrene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Tetrachloroethene	< 1.0	U		1	< 4.0	U		4	< 5.0	*U		5	< 5.0	U		5
Tetrahydrofuran	88			5	89			20	74			25	88			25
Toluene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Trichloroethene	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Vinyl Chloride	< 1.0	U		1	< 4.0	U		4	< 5.0	U		5	< 5.0	U		5
Xylenes (unspecified)	< 2.0	U		2	< 8.0	U		8	< 10	U		10	< 10	U		10

Sample ID / Date	GP-8 2011-09-15				GP-8 2012-03-27				GP-8 2012-09-20				GP-8 2013-03-25			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	4.85				6.41				NA				0.64			
Iron, Ferrous	< 0.50	U		0.5					NA				0.05			
Oxidation Reduction Potential	242.7				185.2				NA				140.9			
pH	5.56				6.09				NA				6.59			
Specific Conductance	484				336				NA				343			
Temperature	12.6				9.57				NA				8.62			
Turbidity, field	0.68				0.09				NA				0.26			
Metals																
Antimony	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1				
Arsenic	< 1.0	U		1	< 1.0	U		1	0.78	J		1	0.21	J		1
Arsenic, dissolved	0.29	J		1	0.12	J		1	0.76	J		1				
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7				
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	0.096	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5				
Chromium	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004				
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005				
Manganese	38			0.003	28			0.003	78			0.003	55	B		0.003
Manganese, dissolved	36			0.003	25			0.003	88			0.003				
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	0.05	J		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	0.045	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Zinc	< 10	U		0.01	< 10	U		0.01	2.7	J		0.01	1.8	J		0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds																
2-Methylphenol	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
Naphthalene	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
N-Nitrosodibutylamine	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.5	U		9.5
N-Nitrosopyrrolidine	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.5	U		9.5
o-Toluidine	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.5	U		9.5
Phenol	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
Pyridine	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	0.48	J		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	< 1.6	U		1.6	< 1.6	U		1.6	38	J		1.6	< 1.6	U		1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1	< 1.0	U		1	0.7	J		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	< 1.0	U		1	0.55	J		1	3.5			1
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	7.6			5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	GP-8 2013-09-25 Result	LQual	VQual	RL	GP-8 2014-05-05 Result	LQual	VQual	RL	GP-8 2014-10-03 Result	LQual	VQual	RL	GP-8 2015-05-07 Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	7.43				0.94				0.09				0.09			
Iron, Ferrous	mg/l	---	0.1												1			
Oxidation Reduction Potential	mV	---	100				111.3				77.8				126.2			
pH	SU	---	6.47				6.31				6.42				6.14			
Specific Conductance	µs/cm	---	486				360				442				373			
Temperature	CELSIUS	---	12.7				10.19				12.55				10.98			
Turbidity, field	NTU	---	5.8				0.3				2.5				0.77			
Metals																		
Antimony	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	2			1					13.9			1	< 1.0	U		1
Arsenic, dissolved	µg/l	10	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Beryllium	µg/l	4	0.031	J		0.7					< 0.70	U		0.7	< 0.70	^U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	170			0.003					67			0.003	51	B		0.003
Manganese, dissolved	µg/l	300	35			0.003					65			0.003	51			0.003
Selenium	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	UJ		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	2.4	J		0.01					< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01					< 10	U		0.01	3.3	J		0.01
Semi Volatile Organic Compounds	Semi Volatile Organic Co																	
2-Methylphenol	µg/l	540	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5	< 5.5	U		5.5
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5	< 5.5	U		5.5
Naphthalene	µg/l	100	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5	< 5.5	U		5.5
N-Nitrosodibutylamine	µg/l	0.003	< 10	*U		10	< 9.4	U		9.4	< 10	U		10	< 11	U		11
N-Nitrosopyrrolidine	µg/l	0.03	< 10	U		10	< 9.4	UJ		9.4	< 10	U		10	< 11	U		11
o-Toluidine	µg/l	0.2	< 10	U		10	< 9.4	UJ		9.4	< 10	U		10	< 11	U		11
Phenol	µg/l	2000	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5	< 5.5	U		5.5
Pyridine	µg/l	9	< 25	U		25	< 23	U		23	< 25	U		25	< 28	U		28
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	1.1	J		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	0.51	J		1	5.5			1	< 1.0	U		1	1.8	B		1
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	*U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	Units	Groundwater Performance Standards (µg/L)	GP-8 2015-10-26 Result	LQual	VQual	RL	GP-8 2017-03-29 Result	LQual	VQual	RL	GP-8 2017-06-29 Result	LQual	VQual	RL	GP-8 2017-08-08 Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.52				0.43				2.99				0.24			
Iron, Ferrous	mg/l	---					0				0				0			
Oxidation Reduction Potential	mV	---	77.3				135.4				266.6				74.4			
pH	SU	---	6.19				6.25				5.63				6.37			
Specific Conductance	µs/cm	---	480				335				422				491			
Temperature	CELSIUS	---	10.84				6.66				15.44				14.38			
Turbidity, field	NTU	---	0.67				1.23				4.95				3.86			
Metals																		
Antimony	µg/l	6	< 1.0	U		1												
Antimony, dissolved	µg/l	6	< 1.0	U		1												
Arsenic	µg/l	10	0.43	J		1	0.49	J		1.0	0.81	J	J	1.0	0.30	J		1.0
Arsenic, dissolved	µg/l	10	0.46	J		1	0.38	J		1.0	0.42	J	J	1.0	0.35	J		1.0
Beryllium	µg/l	4	< 0.70	^U		0.7												
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7												
Cadmium	µg/l	5	0.11	J		0.5												
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5												
Chromium	µg/l	100	< 4.0	U		0.004												
Chromium, dissolved	µg/l	100	< 4.0	U		0.004												
Lead	µg/l	15	< 5.0	U		0.005												
Lead, dissolved	µg/l	15	< 5.0	U		0.005												
Manganese	µg/l	300	80	B		0.003	500			0.0030	740			3.0	570	B		3.0
Manganese, dissolved	µg/l	300	79			0.003	470			0.0030	530			3.0	547	B		3.0
Selenium	µg/l	50	< 15	U		0.015												
Selenium, dissolved	µg/l	50	< 15	U		0.015												
Silver	µg/l	100	< 3.0	U		0.003												
Silver, dissolved	µg/l	100	< 3.0	U		0.003												
Thallium	µg/l	2	< 0.20	U		0.2												
Thallium, dissolved	µg/l	2	< 0.20	^U		0.2												
Zinc	µg/l	2000	< 10	UJ		0.01												
Zinc, dissolved	µg/l	2000	1.9	J		0.01												
Semi Volatile Organic Compounds	Semi Volatile Organic Co																	
2-Methylphenol	µg/l	540	< 4.8	U		4.8												
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.8	U		4.8												
Naphthalene	µg/l	100	< 4.8	U		4.8												
N-Nitrosodibutylamine	µg/l	0.003	< 9.5	UJ		9.5												
N-Nitrosopyrrolidine	µg/l	0.03	< 9.5	UJ		9.5												
o-Toluidine	µg/l	0.2	< 9.5	UJ		9.5												
Phenol	µg/l	2000	< 4.8	U		4.8												
Pyridine	µg/l	9	< 24	U		24												
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
1,4-Dioxane	µg/l	4	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U	U	1.6	< 1.6	U		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U	U	10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U	U	10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
cis/trans 1,2-Dichloroethene	µg/l	---					< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	U	UJ	5.0	< 5.0	U	U	5.0	< 5.0	U		5.0
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0

Parameter	Units	Groundwater Performance Standards (µg/L)	GP-8 2017-10-11 Result	LQual	VQual	RL	MW-10 2011-09-13 Result	LQual	VQual	RL	MW-10 2012-03-28 Result	LQual	VQual	RL	MW-10 2012-09-25 Result	LQual	VQual	RL	MW-10 2013-03-20 Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.42				-0.4				2.29				NA				1.4			
Iron, Ferrous	mg/l	---	0				7.7				2.74				NA				1.24			
Oxidation Reduction Potential	mV	---	90				-0.08				-236.5				NA				15			
pH	SU	---	6.13				6.7				6.79				NA				6.75			
Specific Conductance	µs/cm	---	421				216.4				50				NA				656			
Temperature	CELSIUS	---	13.3				14.88				7.76				NA				6.31			
Turbidity, field	NTU	---	3.32				45.1				50				NA				66.5			
Metals																						
Antimony	µg/l	6					< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6					< 1.0	U		1	< 1.0	U		1	21.31			1				
Arsenic	µg/l	10	0.41	J		1.0	90.7			1	36.4			1	88.3			1	77.1			1
Arsenic, dissolved	µg/l	10	0.37	J		1.0	27.4			1	15.3			1	57			1				
Beryllium	µg/l	4					< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4					< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7				
Cadmium	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	20.86			0.5				
Chromium	µg/l	100					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	1.5	J		0.004
Chromium, dissolved	µg/l	100					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004				
Lead	µg/l	15					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005				
Manganese	µg/l	300	681			3.0	1500			0.003	5400			0.003	920			0.003	5000	B		0.003
Manganese, dissolved	µg/l	300	616	B		3.0	1400			0.003	5400			0.003	900	B		0.003				
Selenium	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Silver	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	µg/l	2					< 0.20	U		0.2	< 0.20	U		0.2	0.014	J		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					0.018	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Zinc	µg/l	2000					< 10	UJ		0.01	< 10	UJ		0.01	< 10	U		0.01	1.9	J		0.01
Zinc, dissolved	µg/l	2000					< 10	U		0.01	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds	Semi Volatile Organic Co																					
2-Methylphenol	µg/l	540	< 5.0	U		5.0	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.9	U		4.9
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.0	U		5.0	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.9	*U		4.9
Naphthalene	µg/l	100	< 5.0	U		5.0	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.9	U		4.9
N-Nitrosodibutylamine	µg/l	0.003	< 10	U		10	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.7	U		9.7
N-Nitrosopyrrolidine	µg/l	0.03	< 10	U		10	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.7	U		9.7
o-Toluidine	µg/l	0.2	< 10	U		10	< 9.4	UJ		9.4	< 9.4	U		9.4	< 9.5	U		9.5	< 9.7	U		9.7
Phenol	µg/l	2000	< 5.0	U		5.0	< 4.7	U		4.7	< 4.7	U		4.7	< 4.7	U		4.7	< 4.9	U		4.9
Pyridine	µg/l	9	< 25	U		25	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	0.92	J		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1.0	3			1	2.8			1	2.4			1	2.3			1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1.0	3.7			1	4.4			1	3.4			1	3.5			1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	< 1.6	U		1.6	3.2			1.6	5.5			1.6	3	J		1.6	7	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5.0	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---	< 2.0	U		2.0																
cis-1,2-Dichloroethene	µg/l	70	< 1.0	U		1.0	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U	J-	1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5.0	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2.0	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group: Downgradient Groundwater Area Including GSA

Sample ID / Date			MW-10 2013-09-24				MW-10 2014-05-07				MW-10 2014-10-31				MW-10 2015-05-08				MW-10 2015-10-28			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.7				0.16				0.06				0.16				0.38			
Iron, Ferrous	mg/l	---	3.2				1.5				1.5				2.5				0.5			
Oxidation Reduction Potential	mV	---	-7				-88.5				-73.4				35.2				16.2			
pH	SU	---	6.68				6.71				6.68				6.75				6.64			
Specific Conductance	µs/cm	---	217				869				309				561				135			
Temperature	CELSIUS	---	12.3				8.76				11.48				9.5				10.92			
Turbidity, field	NTU	---	121				95.6				79.5				62				4			
Metals																						
Antimony	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	139			1					112			1	21.5			1	81	B		1
Arsenic, dissolved	µg/l	10	30.3			1					15			1	11.1			1	57.2			1
Beryllium	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	UJ		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7	0.031	J		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	0.043	J		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	U		0.004					1.3	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	1200			0.003					1900			0.003	4800	B		0.003	860			0.003
Manganese, dissolved	µg/l	300	1100			0.003					1800			0.003	4800			0.003	900	B		0.003
Selenium	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2					< 0.20	U		0.2	0.023	J		0.2	0.015	J		0.2
Thallium, dissolved	µg/l	2	0.01	J		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	3	J		0.01					< 10	U		0.01	< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000	5.1	J		0.01					< 10	U		0.01	2.7	J		0.01	3	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																					
2-Methylphenol	µg/l	540	< 4.0	U		4	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 4.7	U		4.7
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.0	U		4	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 4.7	U		4.7
Naphthalene	µg/l	100	< 4.0	U		4	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 4.7	U		4.7
N-Nitrosodibutylamine	µg/l	0.003	< 7.9	*U		7.9	< 9.4	UJ		9.4	< 10	U		10	< 9.3	U		9.3	< 9.5	UJ		9.5
N-Nitrosopyrrolidine	µg/l	0.03	< 7.9	*U		7.9	< 9.4	UJ		9.4	< 10	U		10	< 9.3	U		9.3	< 9.5	UJ		9.5
o-Toluidine	µg/l	0.2	< 7.9	U		7.9	< 9.4	UJ		9.4	< 10	U		10	< 9.3	U		9.3	< 9.5	UJ		9.5
Phenol	µg/l	2000	< 4.0	U		4	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 4.7	U		4.7
Pyridine	µg/l	9	< 20	U		20	< 24	U		24	< 25	U		25	< 23	U		23	< 24	U		24
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	2.9			1	2.3			1	3.7			1	3.1			1	3.7			1
1,1-Dichloroethene	µg/l	7	3.8			1	3			1	4			1	5.6			1	4.4			1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	< 2.7	U		2.7	16			1.6	3.9			1.6	12			1.6	1.5	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Sample ID / Date	MW-11 2011-09-16				MW-11 2012-03-29				MW-11 2012-09-24				MW-11 2013-03-21			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.2				0.41				NA				0.14			
Iron, Ferrous	2.5				0.68				NA				1.2			
Oxidation Reduction Potential	-122.2				-66.7				NA				-113.5			
pH	6.6				7.47				NA				6.68			
Specific Conductance	3938				40				NA				1947			
Temperature	10.74				9.23				NA				8.25			
Turbidity, field	22.1				1.13				NA				3.61			
Metals																
Antimony	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1	0.54	J		1				
Arsenic	2380			10	2650			5	2480			5	2060			5
Arsenic, dissolved	2260			10	2500			5	2460			5				
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	UJ		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	0.031	J		0.7				
Cadmium	< 0.50	UJ		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	< 0.50	UJ		0.5	< 0.50	UL		0.5	< 0.50	U		0.5				
Chromium	4.8			0.004	2.7	J		0.004	2.9	J		0.004	2.5	J		0.004
Chromium, dissolved	4			0.004	2.5	J		0.004	3	J		0.004				
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005				
Manganese	86			0.003	250			0.003	84			0.003	76			0.003
Manganese, dissolved	79			0.003	260			0.003	78			0.003				
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	2.4	J		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	0.13	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Zinc	< 10	U		0.01	20			0.01	3.8	J		0.01	1.8	J		0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds																
2-Methylphenol	< 4.7	U		4.7	< 4.7	U		4.7	< 5.1	U		5.1	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	1.8	J		4.7	< 4.7	U		4.7	< 5.1	U		5.1	< 4.8	UJ		4.8
Naphthalene	< 4.7	U		4.7	1.7	J		4.7	2.5	J		5.1	1.7	J		4.8
N-Nitrosodibutylamine	< 9.4	UJ		9.4	< 9.5	U		9.5	< 10	U		10	< 9.5	UJ		9.5
N-Nitrosopyrrolidine	< 9.4	UJ		9.4	< 9.5	U		9.5	< 10	U		10	< 9.5	UJ		9.5
o-Toluidine	< 9.4	UJ		9.4	2	J		9.5	8.8	J		10	12	J		9.5
Phenol	< 4.7	U		4.7	< 4.7	U		4.7	< 5.1	U		5.1	< 4.8	U		4.8
Pyridine	< 24	U		24	< 24	U		24	< 25	U		25	< 24	UJ		24
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
1,1,2-Trichloroethane	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
1,1-Dichloroethane	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
1,1-Dichloroethene	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
1,2-Dichloroethane	< 1.0	U		1	< 2.0	U		2	0.46	J		1	0.82	J		2
1,2-Dichloropropane	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
1,4-Dichlorobenzene	2.9			1	< 2.0	U		2	2.4			1	1.8	J		2
1,4-Dioxane	200			6.4	180			6.4	260			23	440			32
2-Butanone (MEK)	< 10	U		10	< 20	U		20	< 10	U		10	< 20	U		20
Acetone	19			10	20	J		20	6.9	J		10	11	J		20
Acrylonitrile	< 5.0	U		5	< 10	U		10	< 5.0	U		5	< 10	U		10
Benzene	6.8			1	4.2			2	12			1	12			2
Carbon tetrachloride	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Chloroform	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	1.3	J		2	< 4.0	U		4	2.6			2	2.4	J		4
Dichloromethane (Methylene chloride)	1.2			1	< 2.0	U		2	1.4			1	1.4	J		2
Ethyl benzene	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Ethyl methacrylate	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
n-Propylbenzene	5			1	4.6			2	15			1	12			2
Styrene	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Tetrachloroethene	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Tetrahydrofuran	320			5	240			10	770			10	850			10
Toluene	1.4			1	< 2.0	U		2	1.9			1	1.5	J		2
Trichloroethene	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Vinyl Chloride	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2
Xylenes (unspecified)	92			2	87			4	240			4	140			4

Sample ID / Date	MW-11 2013-09-25				MW-11 2014-05-07				MW-11 2014-10-29				MW-11 2015-05-08			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.73				0.58				1.05				0.04			
Iron, Ferrous	3.05				4.75				2.5				2			
Oxidation Reduction Potential	-79				-146.6				-150.8				-66.1			
pH	6.67				6.51				6.58				6.35			
Specific Conductance	2239				1765				1814				1423			
Temperature	12.3				11.37				11.28				11.02			
Turbidity, field	4.3				1.87				1.42				11.2			
Metals																
Antimony	0.45	J		1					0.44	J		1	0.45	J		1
Antimony, dissolved	0.44	J		1					0.46	J		1	0.46	J		1
Arsenic	2500			1					2780			5	2400			5
Arsenic, dissolved	2490			1					2790	B		5	2540			5
Beryllium	< 0.70	U		0.7					< 0.70	U		0.7	0.031	J		0.7
Beryllium, dissolved	< 0.70	U		0.7					< 0.70	U		0.7	0.032	J		0.7
Cadmium	< 0.50	U		0.5					< 0.50	U		0.5	0.025	J		0.5
Cadmium, dissolved	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Chromium	< 4.0	UJ		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	1.2	J		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Lead	< 5.0	U		0.005	3	J		0.005	5			0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005					4.5	J		0.005	< 5.0	U		0.005
Manganese	250			0.003					400			0.003	300	B		0.003
Manganese, dissolved	250			0.003					420			0.003	310			0.003
Selenium	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Silver	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Thallium	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Zinc	1.9	J		0.01					< 10	U		0.01	< 10	U		0.01
Zinc, dissolved	< 10	U		0.01					7	J		0.01	2.6	J		0.01
Semi Volatile Organic Compounds																
2-Methylphenol	< 5.0	U		5	< 4.8	U		4.8	< 5.0	U		5	< 5.8	U		5.8
bis(2-Ethylhexyl) phthalate	< 5.0	U		5	< 4.8	U		4.8	< 5.0	U		5	< 5.8	U		5.8
Naphthalene	< 5.0	U		5	2.1	J		4.8	1.6	J		5	1.7	J		5.8
N-Nitrosodibutylamine	< 10	*U		10	< 9.6	UJ		9.6	< 10	U		10	< 12	U		12
N-Nitrosopyrrolidine	< 10	U		10	< 9.6	UJ		9.6	< 10	U		10	< 12	U		12
o-Toluidine	< 10	U		10	< 9.6	UJ		9.6	< 10	U		10	3.8	J		12
Phenol	< 5.0	U		5	< 4.8	U		4.8	< 5.0	U		5	0.66	J		5.8
Pyridine	< 25	U		25	< 24	U		24	< 25	U		25	< 29	U		29
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,1,2-Trichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,1-Dichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,1-Dichloroethene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,2-Dichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,2-Dichloropropane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,4-Dichlorobenzene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
1,4-Dioxane	460			32	310			32	200			32	230			32
2-Butanone (MEK)	< 20	U		20	< 100	U		100	< 100	U		100	< 100	U		100
Acetone	< 20	U		20	< 100	U		100	< 100	UJ		100	< 100	U		100
Acrylonitrile	< 10	U		10	< 50	U		50	< 50	U		50	< 50	U		50
Benzene	14			2	18			10	18			10	20			10
Carbon tetrachloride	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
Chloroform	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	2.3	J		4	< 20	U		20	< 20	U		20	< 20	U		20
Dichloromethane (Methylene chloride)	5.9			2	< 10	U		10	< 10	U		10	< 10	U		10
Ethyl benzene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
Ethyl methacrylate	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
n-Propylbenzene	18			2	24			10	27			10	31			10
Styrene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
Tetrachloroethene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	*U		10
Tetrahydrofuran	970			10	1400			50	990			50	1100			50
Toluene	1.3	J		2	< 10	U		10	< 10	U		10	< 10	U		10
Trichloroethene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
Vinyl Chloride	< 2.0	U		2	< 10	U		10	< 10	U		10	< 10	U		10
Xylenes (unspecified)	230			4	540			20	380			20	700			20

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

		Group	Downgradient Groundwater Area Including GSA																																																			
		Sample ID / Date	MW-11 2015-10-27				MW-11D 2011-09-16				MW-11D 2012-03-29				MW-11D 2012-09-24				MW-11D 2013-03-21				MW-11D 2013-09-25				MW-11D 2014-05-07				MW-11D 2014-10-29				MW-11D 2015-05-08				MW-11D 2015-10-27				MW-11S 2011-09-16				MW-11S 2012-03-29				MW-11S 2012-09-24			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																																																							
Dissolved Oxygen	mg/l	---	0.43				0.27				0.53				NA				0.19				0.68				0.5				0.03				0.04				0.1				3.66				0.41				NA			
Iron, Ferrous	mg/l	---	1.5				6.2				1.44				NA				0.33				1.15				2				2.5				2.5				2.5				8.5				1.38				NA			
Oxidation Reduction Potential	mV	---	-71.1				-153.5				-261.1				NA				-75.3				-71				-139.8				-157.7				-121.1				-86.7				-159.1				-269.2				NA			
pH	SU	---	6.12				7.2				6.83				NA				7.41				7.28				7.05				7.09				7.01				6.89				6.45				6.81				NA			
Specific Conductance	µs/cm	---	1033				564				256				NA				502				434				799				964				638				322				1176				99				NA			
Temperature	CELSIUS	---	11.4				11.46				8.74				NA				8.95				12.6				11.15				11.44				10.76				11.26				14.48				8.06				NA			
Turbidity, field	NTU	---	39.6				2.51				3.82				NA				3.4				3				0.78				5.1				1.79				2.1				4.42				4.62				NA			
Metals																																																							
Antimony	µg/l	6	0.44	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					< 1.0	U		1	0.17	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	0.47	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					< 1.0	U		1					< 1.0	U		1	0.18	J		1	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	2460			5	67.8			1	41.6			1	68.2			1	18.1			1	45.4			1					274			1	49.9			1	47.9			1	730	J		5	351			1	350			1
Arsenic, dissolved	µg/l	10	2440			5	67.5			1	37.8			1	67.1			1					44			1					271	B		1	52.6			1	47.8			1	817	J		10	346			1	344			1
Beryllium	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	UJ		0.7	< 0.70	U		0.7	< 0.70	UJ		0.7	< 0.70	U		0.7	0.037	J		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7					< 0.70	U		0.7	0.031	J		0.7	< 0.70	U		0.7					< 0.70	U		0.7	0.046	J		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5	0.03	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	0.029	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	UJ		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	UJ		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004				
Chromium, dissolved	µg/l	100	1.3	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	U		0.004					1	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	1.4	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	4.9	J		0.005	< 5.0	U		0.005	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	205			0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005					3.7	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	200			0.005
Manganese	µg/l	300	370			0.003	890			0.003	790			0.003	860			0.003	890			0.003	730			0.003					1700			0.003	1700	B		0.003	1200			0.003	5400			0.003	3700			0.003				
Manganese, dissolved	µg/l	300	360			0.003	930			0.003	780			0.003	830			0.003					700			0.003					1800			0.003	1700			0.003	1200			0.003	5300			0.003	3700			0.003	2500			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	206			0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	50.3			0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2	0.019	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	0.29			0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	0.27	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	UJ		0.01	< 10	UJ		0.01	< 10	UJ		0.01	1.9	J		0.01	< 10	UJ		0.01	< 10	UJ		0.01					< 10	U		0.01	< 10	^U		0.01	< 10	UJ		0.01	< 10	U		0.01	< 10	UJ		0.01				
Zinc, dissolved	µg/l	2000	2.9	J		0.01	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					< 10	U		0.01					< 10	U		0.01	< 10	U		0.01	2	J		0.01	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																																																						
2-Methylphenol	µg/l	540	< 5.7	U		5.7	< 4.8	U		4.8	< 4.7	U		4.7	< 5.4	U		5.4	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1	< 5.6	U		5.6	< 5.4	U		5.4	< 4.7	U		4.7	< 4.9	U		4.9	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.7	U		5.7	< 4.8	U		4.8	< 4.7	U		4.7	< 5.4	U		5.4	< 4.8	*U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1	< 5.6	U		5.6	< 5.4	U		5.4	< 4.7	U		4.7	< 4.9	U		4.9	< 4.8	U		4.8
Naphthalene	µg/l	100	2	J		5.7	< 4.8	U		4.8	< 4.7	U		4.7	< 5.4	U		5.4	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1	< 5.6	U		5.6	< 5.4	U		5.4	< 4.7	U		4.7	< 4.9	U		4.9	85.9			4.9
N-Nitrosodibutylamine	µg/l	0.003	< 11	UJ		11	< 9.5	UJ		9.5	< 9.4	U		9.4	< 11	U		11	< 9.6	U		9.6	< 10	*U		10	< 9.5	UJ		9.5	< 10	U		10	< 11	U		11	< 11	UJ		11	< 9.4	UJ		9.4	< 9.9	U		9.9	96.8			9.8
N-Nitrosopyrrolidine	µg/l	0.03	< 11	UJ		11	< 9.5	UJ		9.5	< 9.4	U		9.4	< 11	U		11	< 9.6	U		9.6	< 10	U		10	< 9.5	UJ		9.5	< 10	U		10	< 11	U		11	< 11	UJ		11	< 9.4	UJ		9.4	< 9.9	U		9.9	81.2			9.8
o-Toluidine	µg/l	0.2	3.2	J		11	< 9.5	UJ		9.5	< 9.4	U		9.4	< 11	U		11	< 9.6	U		9.6	< 10	U		10	< 9.5	UJ		9.5	< 10	U		10	< 11	U		11	< 11	UJ		11	< 9.4	UJ		9.4	< 9.9	U		9.9	< 9.6	U		9.6
Phenol	µg/l	2000	< 5.7	U		5.7	< 4.8	U		4.8	< 4.7	U		4.7	< 5.4	U		5.4	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1	< 5.6	U		5.6	< 5.4	U		5.4	< 4.7	U		4.7	< 4.9	U		4.9	< 4.8	U		4.8
Pyridine	µg/l	9	< 29	U		29	< 24	U		24	< 24	U		24	< 27	U		27	< 24	U		24	< 25	U		25	< 24	U		24	< 25	U		25	< 28	U		28	< 27	U		27	< 24	U		24	< 25	U		25	88.6			24
Volatile Organic Compounds																																																							
1,1,1-Trichloroethane	µg/l	200	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	25.2			1
1,1-Dichloroethane	µg/l	360	< 10	U		10	0.55	J		1	0.51	J		1	< 1.0	U		1	0.6	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.64	J		1	< 1.0	U		1	28.3			1
1,1-Dichloroethene	µg/l	7	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	28.3			1
1,2-Dichloroethane	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.41	J		1	< 1.0	U		1	< 1.0	U		1	0.36	J		1	0.42	J		1	< 1.0	U		1	1	J		1	< 1.0	U		1	27.2			1
1,2-Dichloropropane	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	27			1
1,4-Dioxane	µg/l	4	200			6.4	69			1.6	76			1.6	76			5.3					100			6.4	160			6.4	140			6.4	150			6.4	49			1.6	69			3.2	12			1.6	10	J		1.6
2-Butanone (MEK)	µg/l	4000	< 100	U		100	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	131			10
Acetone	µg/l	5600	< 100	U		100	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	UJ		10	4.2	J		10	< 10	U		10	6	J		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 50	U		50	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	21			10	0.88	J		1	< 1.0	U		1	0.93	J		1	< 1.0	U		1	0.61	J		1	1.6			1	2.5			1	1.6			1	0.87	J		1	3.3			1	0.42	J		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	24.4			1
Chloroform	µg/l	80	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	29.1			1
cis/trans 1,2-Dichloroethene	µg/l	---																																																					
cis-1,2-Dichloroethene	µg/l	70	< 20	U		20	1.3	J		2	< 2.0	U		2	1.7	J		2	1.2	J		2	0.97	J		2	1.1	J		2	2.8			2	1.2	J		2	0.82	J		2	1.5	J		2	< 2.0	U		2	< 1.0	U		1
Dichloromethane (Methylene chloride)	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.52	J		1	< 1.0	U		1	0.62	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.77	J		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	26			10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	4.6			1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	1200			50	12			5	6			5	11			5	3.6	J		5	3.5	J		5	9.9			5	81			5	10			5	6.8			5	77			5	6.7			5	9.3			5
Toluene	µg/l	1000	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	29			1
Vinyl Chloride	µg/l	2	< 10	U		10	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	29.4			1
Xylenes (unspecified)	µg/l	10000	510			20	3.9			2	1.7	J		2	1.8	J		2	< 2.0	U		2	0.73	J		2	< 2.0	U		2	5.6			2	< 2.0	U		2	< 2.0	U		2	7.8			2	0.84	J		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-11S 2013-03-21 Result	LQual	VQual	RL	MW-11S 2013-09-25 Result	LQual	VQual	RL	MW-11S 2014-05-07 Result	LQual	VQual	RL	MW-11S 2014-10-29 Result	LQual	VQual	RL	MW-11S 2015-05-08 Result	LQual	VQual	RL	MW-11S 2015-10-27 Result	LQual	VQual	RL
Field Parameters																										
Dissolved Oxygen	mg/l	---	0.56				0.51				0.85				0.22				0.06				0.16			
Iron, Ferrous	mg/l	---	1.08				5.6				6				2				1				0.5			
Oxidation Reduction Potential	mV	---	-140.8				-79				-152.2				-142.7				-98				-89.9			
pH	SU	---	6.84				6.72				6.43				6.55				6.51				6.35			
Specific Conductance	µs/cm	---	869				1079				1402				1009				577				321			
Temperature	CELSIUS	---	8.63				13.9				8.94				12.96				9.6				11.57			
Turbidity, field	NTU	---	1.52				7.1				5				1.01				3.7				5.6			
Metals																										
Antimony	µg/l	6	< 1.0	U		1	< 1.0	UJ		1					0.36	J		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6					< 1.0	UJ		1					< 1.0	UJ		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	988			5	360			1					296			1	528			1	519			1
Arsenic, dissolved	µg/l	10					375			1					302	B		1	552			1	556			1
Beryllium	µg/l	4	< 0.70	U		0.7	< 0.70	UJ		0.7					0.28	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4					< 0.70	UJ		0.7					< 0.70	UJ		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5	0.054	J		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	1.4	J		0.004	< 4.0	UJ		0.004					< 4.0	UJ		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100					1.6	J		0.004					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					< 5.0	U		0.005					3.2	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	5900			0.003	7300			0.003					4000			0.003	4200	B		0.003	3600			0.003
Manganese, dissolved	µg/l	300					7000			0.003					4000			0.003	4000	B		0.003	3600			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	UJ		0.2					0.24	J		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	UJ		0.2					< 0.20	UJ		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	UJ		0.01	< 10	UJ		0.01					< 10	U		0.01	< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000					< 10	U		0.01					3.3	J		0.01	< 10	U		0.01	2.3	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																									
2-Methylphenol	µg/l	540	< 4.9	U		4.9	< 5.0	U		5	< 4.9	U		4.9	< 5.0	U		5	< 5.2	U		5.2	< 5.1	U		5.1
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.9	*U		4.9	< 5.0	UJ		5	< 4.9	UJ		4.9	< 5.0	U		5	< 5.2	UJ		5.2	< 5.1	U		5.1
Naphthalene	µg/l	100	< 4.9	U		4.9	< 5.0	U		5	< 4.9	U		4.9	< 5.0	U		5	< 5.2	U		5.2	< 5.1	U		5.1
N-Nitrosodibutylamine	µg/l	0.003	< 9.8	U		9.8	< 10	*U		10	< 9.8	UJ		9.8	< 10	U		10	< 10	U		10	< 10	UJ		10
N-Nitrosopyrrolidine	µg/l	0.03	< 9.8	U		9.8	< 10	U		10	< 9.8	UJ		9.8	< 10	U		10	< 10	U		10	< 10	UJ		10
o-Toluidine	µg/l	0.2	5	J		9.8	< 10	U		10	< 9.8	UJ		9.8	< 10	U		10	< 10	U		10	< 10	UJ		10
Phenol	µg/l	2000	< 4.9	U		4.9	< 5.0	U		5	< 4.9	U		4.9	< 5.0	U		5	< 5.2	U		5.2	< 5.1	U		5.1
Pyridine	µg/l	9	< 24	U		24	< 25	U		25	< 24	U		24	< 25	U		25	< 26	U		26	< 26	U		26
Volatile Organic Compounds																										
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	UF1		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	1.1			1	3.7			1	< 2.0	U		2	< 1.0	U		1	4.7			1	2.6			1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	2.2			1	2.7			1	2.5			2	< 1.0	U		1	0.74	J		1	0.51	J		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	UF1		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	110			16	82			16	160			16	< 16	UJ		16	47			16	25	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 20	U		20	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	4.5	J		10	< 10	UJ		10	12	J		20	< 10	UJ		10	5.1	J		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 10	U		10	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	6.5			1	4.1			1	10			2	0.67	J		1	1.6	J		1	1.3	J		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	UF1		1
Chloroform	µg/l	80	< 1.0	U		1	0.35	J		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																								
cis-1,2-Dichloroethene	µg/l	70	1.6	J		2	3.7			2	2.4	J		4	< 2.0	U		2	1.8	J		2	1.2	J		2
Dichloromethane (Methylene chloride)	µg/l	5	0.63	J		1	2	J		1	1	J		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	11			1	< 1.0	U		1	15			2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	UF1		1
Tetrahydrofuran	µg/l	227	130			5	2	J		5	300			10	< 5.0	U		5	1.5	J		5	< 5.0	U		5
Toluene	µg/l	1000	0.99	J		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	UF1		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	1.7			1	< 2.0	U		2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	59			2	< 2.0	U		2	63			4	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	MW-13D 2011-09-15 Result	LQual	VQual	RL	MW-13D 2012-03-27 Result	LQual	VQual	RL	MW-13D 2012-09-20 Result	LQual	VQual	RL	MW-13D 2013-03-25 Result	LQual	VQual	RL	MW-13D 2013-09-26 Result	LQual	VQual	RL	MW-13D 2014-05-06 Result	LQual	VQual	RL	MW-13D 2014-10-03 Result	LQual	VQual	RL
Field Parameters																												
Dissolved Oxygen	0.37				0.25				NA				0.25				1.34				0.8				1			
Iron, Ferrous	4.1				2.95				NA				1.89				2.05				2.5				3			
Oxidation Reduction Potential	-26.5				-60.7				NA				-90.2				-52				-77.1				-129.1			
pH	6.44				6.88				NA				7.02				6.4				6.41				6.9			
Specific Conductance	739				579				NA				457				714				572				692			
Temperature	13.16				9.67				NA				8.82				11.2				10.69				10.95			
Turbidity, field	4.83				5.04				NA				1.53				7.9				3.95				2.22			
Metals																												
Antimony	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1					< 1.0	U		1
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					0.15	J		1					< 1.0	U		1
Arsenic	85.8			1	71.9			1	71.5			1	59.3			1	164			1					88			1
Arsenic, dissolved	71.2			1	61.5			1	67.3			1					80.8			1					83.3	B		1
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7	0.038	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7					0.035	J		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7					< 0.70	U		0.7
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5
Chromium	0.97	J		0.004	< 4.0	U		0.004	206			0.004	< 4.0	UJ		0.004	1.3	J		0.004					< 4.0	UJ		0.004
Chromium, dissolved	0.9	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004					1.7	J		0.004					1.1	J		0.004
Lead	< 5.0	U		0.005	4.3	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005					< 5.0	U		0.005
Manganese	1900			0.003	1700			0.003	1710	4		0.003	1500	B		0.003	2000			0.003					1900			0.003
Manganese, dissolved	1800			0.003	1700			0.003	1700			0.003					2000			0.003					1900			0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003
Thallium	0.047	J		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Thallium, dissolved	0.04	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2					< 0.20	U		0.2
Zinc	< 10	U		0.01	< 10	UJ		0.01	1.8	J		0.01	< 10	UJ		0.01	3.3	J		0.01					< 10	U		0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					< 10	U		0.01					< 10	U		0.01
Semi Volatile Organic Compounds																												
2-Methylphenol	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1
bis(2-Ethylhexyl) phthalate	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	*U		5	< 4.8	U		4.8	< 5.1	U		5.1
Naphthalene	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1
N-Nitrosodibutylamine	< 9.6	UJ		9.6	< 9.5	U		9.5	< 9.5	U		9.5	< 9.5	U		9.5	< 10	U		10	< 9.5	U		9.5	< 10	U		10
N-Nitrosopyrrolidine	< 9.6	UJ		9.6	< 9.5	U		9.5	< 9.5	U		9.5	< 9.5	U		9.5	< 10	UJ		10	< 9.5	UJ		9.5	< 10	U		10
o-Toluidine	< 9.6	UJ		9.6	< 9.5	U		9.5	< 9.5	U		9.5	1.4	J		9.5	< 10	UJ		10	< 9.5	UJ		9.5	< 10	U		10
Phenol	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.1	U		5.1
Pyridine	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24	< 25	U		25	< 24	U		24	< 25	U		25
Volatile Organic Compounds																												
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	6.5			1.6	9.1			1.6	6.9	J		1.6	13			1.6	18			1.6	12			1.6	41			1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene																												
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	2.8	J		5	< 5.0	U		5	< 5.0	U		5	1.9	J		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Sample ID / Date			MW-13D 2015-05-07				MW-13D 2015-10-26				MW-13D 2017-03-29				MW-13D 2017-06-30			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.04				0.97				0.55				0.22			
Iron, Ferrous	mg/l	---	2.5				2								2			
Oxidation Reduction Potential	mV	---	-57.5				-45				-13.1				-111.3			
pH	SU	---	6.75				6.71				6.92				6.76			
Specific Conductance	µs/cm	---	462				396				363				552			
Temperature	CELSIUS	---	11.24				10.61				8.15				15.16			
Turbidity, field	NTU	---	2.71				0.99				35.6				21.4			
Metals																		
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1								
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1								
Arsenic	µg/l	10	91.9			1	87.2			1	182			1.0	199			1.0
Arsenic, dissolved	µg/l	10	84			1	81.8			1	27.6			1.0	82.9			1.0
Beryllium	µg/l	4	< 0.70	^U		0.7	0.055	J		0.7								
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7								
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5								
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5								
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004								
Chromium, dissolved	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004								
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005								
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005								
Manganese	µg/l	300	1500	B		0.003	1700	B		0.003	1800			0.0030	1370			3.0
Manganese, dissolved	µg/l	300	1500	B		0.003	1800			0.003	1800			0.0030	1360			3.0
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015								
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015								
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003								
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003								
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2								
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2								
Zinc	µg/l	2000	< 10	U		0.01	< 10	UJ		0.01								
Zinc, dissolved	µg/l	2000	< 10	U		0.01	2	J		0.01								
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540	< 5.3	U		5.3	< 4.6	U		4.6								
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.3	U		5.3	< 4.6	U		4.6								
Naphthalene	µg/l	100	< 5.3	U		5.3	< 4.6	U		4.6								
N-Nitrosodibutylamine	µg/l	0.003	< 11	U		11	< 9.3	UJ		9.3								
N-Nitrosopyrrolidine	µg/l	0.03	< 11	U		11	< 9.3	UJ		9.3								
o-Toluidine	µg/l	0.2	< 11	U		11	< 9.3	UJ		9.3								
Phenol	µg/l	2000	< 5.3	U		5.3	< 4.6	U		4.6								
Pyridine	µg/l	9	< 26	U		26	< 23	U		23								
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,4-Dioxane	µg/l	4	7.9	J		1.6	13			1.6	4.1			1.6	7.0			1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
cis/trans 1,2-Dichloroethene	µg/l	---									< 2.0	U		2.0	< 2.0	U	U	2.0
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1.0	< 1.0	U	U	1.0
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U*	U*	1.0
Tetrahydrofuran	µg/l	227	< 5.0	U		5	1.8	J		5	< 5.0	U	UJ	5.0	< 5.0	U	U	5.0
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U	U	2.0

Sample ID / Date	MW-13D 2017-08-08				MW-13D 2017-10-11				MW-16D 2011-09-13				MW-16D 2012-03-28			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.13				0.46				-0.45				0.64			
Iron, Ferrous	3.5				3.0				3.8				2.17			
Oxidation Reduction Potential	-75.8				-74.1				-0.18				-256.9			
pH	6.72				6.68				0.86				6.88			
Specific Conductance	493				618				617.6				79			
Temperature	14.69				13.35				13.39				9.44			
Turbidity, field	5.48				8.24				1				3.32			
Metals																
Antimony									< 1.0	U		1	< 1.0	U		1
Antimony, dissolved									< 1.0	U		1	< 1.0	U		1
Arsenic	87.4			1.0	107			1.0	137			1	142			1
Arsenic, dissolved	83.0			1.0	84.6			1.0	136			1	133			1
Beryllium									< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved									< 0.70	U		0.7	< 0.70	U		0.7
Cadmium									< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved									< 0.50	U		0.5	< 0.50	U		0.5
Chromium									< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved									< 4.0	U		0.004	< 4.0	U		0.004
Lead									4.2	J		0.005	< 5.0	U		0.005
Lead, dissolved									< 5.0	U		0.005	< 5.0	U		0.005
Manganese	1570	B		3.0	2020			3.0	1500			0.003	1300			0.003
Manganese, dissolved	1550	B		3.0	2220	B		3.0	1400			0.003	1300			0.003
Selenium									< 15	U		0.015	< 15	U		0.015
Selenium, dissolved									< 15	U		0.015	< 15	U		0.015
Silver									< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved									< 3.0	U		0.003	< 3.0	U		0.003
Thallium									< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved									< 0.20	U		0.2	< 0.20	U		0.2
Zinc									< 10	U		0.01	< 10	U		0.01
Zinc, dissolved									< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds																
2-Methylphenol					< 5.0	U		5.0	< 4.9	U		4.9	< 4.7	U		4.7
bis(2-Ethylhexyl) phthalate					< 5.0	U		5.0	< 4.9	U		4.9	< 4.7	U		4.7
Naphthalene					< 5.0	U		5.0	< 4.9	U		4.9	< 4.7	U		4.7
N-Nitrosodibutylamine					< 10	U		10	< 9.8	UJ		9.8	< 9.4	U		9.4
N-Nitrosopyrrolidine					< 10	U		10	< 9.8	UJ		9.8	< 9.4	U		9.4
o-Toluidine					3.2	J		10	< 9.8	UJ		9.8	< 9.4	U		9.4
Phenol					< 5.0	U		5.0	< 4.9	U		4.9	< 4.7	U		4.7
Pyridine					< 25	U		25	< 25	U		25	< 24	U		24
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	13			1.6	31			6.4	8.7	J		1.6	6.4			1.6
2-Butanone (MEK)	< 10	U		10	< 20	U		20	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 20	U		20	10	J		10	< 10	U		10
Acrylonitrile	< 5.0	U		5.0	< 10	U		10	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1.0	< 2.0	U		2.0	0.43	J		1	0.43	J		1
Carbon tetrachloride	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	< 2.0	U		2.0	< 4.0	U		4.0								
cis-1,2-Dichloroethene	< 1.0	U		1.0	< 2.0	U		2.0	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1.0	< 2.0	U	J-	2.0	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5.0	< 10	J	U AT RL	10	3	J		5	< 5.0	U		5
Toluene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1.0	< 2.0	U		2.0	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2.0	< 4.0	U		4.0	< 2.0	U		2	< 2.0	U		2

Sample ID / Date	MW-16D 2012-09-25				MW-16D 2013-03-20				MW-16D 2013-09-24				MW-16D 2014-05-07				MW-16D 2014-10-31			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	NA				0.24				1.1				0.21				1.4			
Iron, Ferrous	NA				0.74				5.1				2.5				3			
Oxidation Reduction Potential	NA				-57.8				-57				-146.2				-77			
pH	NA				6.94				7.07				6.85				6.83			
Specific Conductance	NA				734				764				8.35				709			
Temperature	NA				7.3				11.7				10.33				10.64			
Turbidity, field	NA				2.78				1.5				2.02				0.9			
Metals																				
Antimony	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					< 1.0	U		1
Antimony, dissolved	0.19	J		1					< 1.0	U		1					< 1.0	U		1
Arsenic	139			1	108			1	141			1					117			1
Arsenic, dissolved	136			1					140			1					122			1
Beryllium	0.035	J		0.7	< 0.70	U		0.7	< 0.70	UJ		0.7					< 0.70	UJ		0.7
Beryllium, dissolved	0.033	J		0.7					< 0.70	U		0.7					< 0.70	UJ		0.7
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Cadmium, dissolved	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5
Chromium	< 4.0	U		0.004	1.3	J		0.004	1	J		0.004					2.1	J		0.004
Chromium, dissolved	1	J		0.004					< 4.0	UJ		0.004					< 4.0	U		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	3.4	J		0.005
Lead, dissolved	< 5.0	U		0.005					< 5.0	U		0.005					3.9	J		0.005
Manganese	1500			0.003	1300			0.003	1400			0.003					1200			0.003
Manganese, dissolved	1500	B		0.003					1300			0.003					1100	^		0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Selenium, dissolved	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	UJ		0.2
Thallium, dissolved	< 0.20	U		0.2					< 0.20	U		0.2					< 0.20	UJ		0.2
Zinc	< 10	U		0.01	2.4	J		0.01	1.8	J		0.01					< 10	U		0.01
Zinc, dissolved	< 10	U		0.01					2.1	J		0.01					< 10	U		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol	< 4.8	U		4.8	< 4.9	U		4.9	< 3.9	U		3.9	< 4.5	U		4.5	< 5.0	U		5
bis(2-Ethylhexyl) phthalate	< 4.8	U		4.8	< 4.9	*U		4.9	< 3.9	U		3.9	< 4.5	U		4.5	< 5.0	U		5
Naphthalene	1.1	J		4.8	< 4.9	U		4.9	< 3.9	U		3.9	< 4.5	U		4.5	< 5.0	U		5
N-Nitrosodibutylamine	< 9.5	U		9.5	< 9.8	U		9.8	< 7.9	*U		7.9	< 9.1	UJ		9.1	< 9.9	U		9.9
N-Nitrosopyrrolidine	< 9.5	U		9.5	< 9.8	U		9.8	< 7.9	*U		7.9	< 9.1	UJ		9.1	< 9.9	U		9.9
o-Toluidine	2	J		9.5	1.8	J		9.8	< 7.9	U		7.9	< 9.1	UJ		9.1	< 9.9	U		9.9
Phenol	< 4.8	U		4.8	< 4.9	U		4.9	< 3.9	U		3.9	0.83	J		4.5	< 5.0	U		5
Pyridine	< 24	U		24	< 24	U		24	< 20	U		20	< 23	U		23	< 25	U		25
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.85	J		1
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	7	J		1.6	4.3	J		1.6	17	J		1.6	8.8	J		1.6	16			1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	UJ		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	0.5	J		1	< 1.0	U		1	0.44	J		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene																				
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	1.8	J		5	2.2	J		5	2.2	J		5	< 5.0	U		5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:

"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-16D 2015-05-08				MW-16D 2015-10-28				MW-17D 2011-09-20				MW-17D 2012-03-27				MW-17D 2012-09-20			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.1				0.16				0.7				0.43				NA			
Iron, Ferrous	mg/l	---	3				1.5				0.6				0.03				NA			
Oxidation Reduction Potential	mV	---	-45.7				-45.2				14.2				39.9				NA			
pH	SU	---	6.81				6.91				6.67				7				NA			
Specific Conductance	µs/cm	---	675				576				460				20				NA			
Temperature	CELSIUS	---	11.89				9.87				11.94				9.09				NA			
Turbidity, field	NTU	---	4				4				3.42				0.24				NA			
Metals																						
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	133			1	147	B		1	2			1	1.4			1	1.1			1
Arsenic, dissolved	µg/l	10	123			1	153			1	1.7			1	1.1			1	1			1
Beryllium	µg/l	4	0.034	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	0.033	J		0.5	< 0.50	U		0.5	0.73			0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	0.078	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	1.2	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	UJ		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	3.2	J		0.005	< 5.0	U		0.005
Manganese	µg/l	300	1300	B		0.003	1500			0.003	280			0.003	270			0.003	390			0.003
Manganese, dissolved	µg/l	300	1200	B		0.003	1500	B		0.003	260			0.003	270			0.003	440			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	UJ		0.2	< 0.20	U		0.2	0.086	J		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	0.077	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	U		0.01	2	J		0.01	< 10	U		0.01	1.6	J		0.01	2.8	J		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	1.5	J		0.01	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																					
2-Methylphenol	µg/l	540	< 4.8	U		4.8	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.8	U		4.8	< 4.8	UJ		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
Naphthalene	µg/l	100	< 4.8	U		4.8	< 4.8	U		4.8	1.6	J		4.8	< 4.7	U		4.7	< 4.8	U		4.8
N-Nitrosodibutylamine	µg/l	0.003	< 9.6	U		9.6	< 9.5	UJ		9.5	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.6	U		9.6
N-Nitrosopyrrolidine	µg/l	0.03	< 9.6	U		9.6	< 9.5	UJ		9.5	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.6	U		9.6
o-Toluidine	µg/l	0.2	< 9.6	U		9.6	2.2	J		9.5	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.6	U		9.6
Phenol	µg/l	2000	< 4.8	U		4.8	< 4.8	U		4.8	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
Pyridine	µg/l	9	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	7.2			1	12			1	0.87	J		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	0.39	J		1	0.76	J		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	8.3			1.6	11			1.6	18			1.6	35			1.6	2.3	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	3.6	J		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	0.43	J		1	0.54	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	1.4	J		2	2.5			2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.52	J		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	1.6	J		5	4.2	J		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	0.97	J		1	1.7			1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	MW-17D 2013-03-25				MW-17D 2013-09-26				MW-17D 2014-05-06				MW-17D 2014-10-03				MW-17D 2015-05-07			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	0.31				0.33				0.98				0.61				0.46			
Iron, Ferrous	0.12												1.5				1			
Oxidation Reduction Potential	-47.3				87				73				-35.1				51.3			
pH	6.98				6.42				6.39				6.6				6.48			
Specific Conductance	434				296				321				270				220			
Temperature	8.85				11.5				10.93				11.65				11.85			
Turbidity, field	1.36				1.2				0.4				0.41				0.27			
Metals																				
Antimony	< 1.0	U		1	< 1.0	UJ		1					< 1.0	U		1	< 1.0	U		1
Antimony, dissolved					0.19	J		1					< 1.0	U		1	< 1.0	U		1
Arsenic	1.2			1	2.3			1					33.7			1	3.8			1
Arsenic, dissolved					2.7			1					32.8	B		1	3.6			1
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved					< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	< 0.50	U		0.5	< 0.50	UJ		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Chromium	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved					< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved					< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005
Manganese	240	B		0.003	1200			0.003					2700			0.003	1800	B		0.003
Manganese, dissolved					1200			0.003					2500			0.003	1600			0.003
Selenium	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Selenium, dissolved					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved					< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2
Zinc	< 10	U		0.01	2.7	J		0.01					< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved					< 10	U		0.01					< 10	U		0.01	2.3	J		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7
bis(2-Ethylhexyl) phthalate	< 4.8	U		4.8	< 5.0	*U		5	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7
Naphthalene	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7
N-Nitrosodibutylamine	< 9.5	U		9.5	< 10	U		10	< 9.6	U		9.6	< 10	U		10	< 9.4	U		9.4
N-Nitrosopyrrolidine	< 9.5	U		9.5	< 10	UJ		10	< 9.6	UJ		9.6	< 10	U		10	< 9.4	U		9.4
o-Toluidine	< 9.5	U		9.5	< 10	UJ		10	< 9.6	UJ		9.6	< 10	U		10	< 9.4	U		9.4
Phenol	< 4.8	U		4.8	< 5.0	U		5	< 4.8	U		4.8	0.45	J		5	< 4.7	U		4.7
Pyridine	< 24	U		24	< 25	U		25	< 24	U		24	< 25	U		25	< 23	U		23
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	9.8			1	0.55	J		1	0.75	J		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	0.56	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	33			1.6	3.6			1.6	3.8			1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene																				
cis-1,2-Dichloroethene	2.2			2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	0.44	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	< 5.0	*U		5	< 5.0	U		5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	1.5			1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	MW-17D 2015-10-26				MW-1R 2015-05-11				MW-1R 2015-10-27			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters												
Dissolved Oxygen	0.5				0.25				0.59			
Iron, Ferrous	1											
Oxidation Reduction Potential	13				99.9				-41.6			
pH	6.63				7.6				7.73			
Specific Conductance	262				188				152			
Temperature	12.14				10.83				10.75			
Turbidity, field	0.24				3.98				3.2			
Metals												
Antimony	< 1.0	U		1	0.25	J		1	0.2	J		1
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1	0.15	J		1
Arsenic	19.7			1	13.5			1	17.4			1
Arsenic, dissolved	18.5			1	14.3			1	18.8			1
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	2500	B		0.003	320			0.003	89			0.003
Manganese, dissolved	2300			0.003	67	B		0.003	69			0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	U		0.2	0.011	J		0.2
Thallium, dissolved	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	1.5	J		0.01	< 10	UJ		0.01	< 10	UJ		0.01
Zinc, dissolved	2.9	J		0.01	2.5	J		0.01	2	J		0.01
Semi Volatile Organic Compounds												
2-Methylphenol	< 4.7	U		4.7	< 24	*U		24	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	< 4.7	UJ		4.7	< 24	UJ		24	< 4.8	U		4.8
Naphthalene	< 4.7	UJ		4.7	< 24	UJ		24	< 4.8	U		4.8
N-Nitrosodibutylamine	< 9.4	UJ		9.4	< 47	*U		47	< 9.7	UJ		9.7
N-Nitrosopyrrolidine	< 9.4	UJ		9.4	< 47	*U		47	< 9.7	UJ		9.7
o-Toluidine	< 9.4	UJ		9.4	< 47	*U		47	< 9.7	UJ		9.7
Phenol	< 4.7	U		4.7	< 24	*U		24	< 4.8	U		4.8
Pyridine	< 23	UJ		23	< 120	U		120	< 24	U		24
Volatile Organic Compounds												
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	< 1.6	U		1.6	1.2	J		1.6	1.4	J		1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene												
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-1R 2017-03-28				MW-1R 2017-06-28				MW-1R 2017-08-07				MW-1R 2017-10-11			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.04				0.23				0.26				0.37			
Iron, Ferrous	mg/l	---					0				0				0			
Oxidation Reduction Potential	mV	---	39.8				90.1				4.4				226.7			
pH	SU	---	8.59				8.27				8.16				8.22			
Specific Conductance	µs/cm	---	195				212				202				247			
Temperature	CELSIUS	---	8.41				10.68				13.35				13.32			
Turbidity, field	NTU	---	27.6				64.2				232				12.4			
Metals																		
Antimony	µg/l	6																
Antimony, dissolved	µg/l	6																
Arsenic	µg/l	10	14.5			1.0	17.5			1.0	17.3			1.0	13.2			1.0
Arsenic, dissolved	µg/l	10	15.4			1.0	13.7			1.0	15.0			1.0	13.7			1.0
Beryllium	µg/l	4																
Beryllium, dissolved	µg/l	4																
Cadmium	µg/l	5																
Cadmium, dissolved	µg/l	5																
Chromium	µg/l	100																
Chromium, dissolved	µg/l	100																
Lead	µg/l	15																
Lead, dissolved	µg/l	15																
Manganese	µg/l	300	51			0.0030	1060			3.0	3030	B		3.0	66.6			3.0
Manganese, dissolved	µg/l	300					107			3.0	37.1	B		3.0	309	B		3.0
Selenium	µg/l	50																
Selenium, dissolved	µg/l	50																
Silver	µg/l	100																
Silver, dissolved	µg/l	100																
Thallium	µg/l	2																
Thallium, dissolved	µg/l	2																
Zinc	µg/l	2000																
Zinc, dissolved	µg/l	2000																
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540													< 5.0	U		5.0
bis(2-Ethylhexyl) phthalate	µg/l	6													< 5.0	U		5.0
Naphthalene	µg/l	100													< 5.0	U		5.0
N-Nitrosodibutylamine	µg/l	0.003													< 10	U		10
N-Nitrosopyrrolidine	µg/l	0.03													< 10	U		10
o-Toluidine	µg/l	0.2													< 10	U		10
Phenol	µg/l	2000													< 5.0	U		5.0
Pyridine	µg/l	9													< 25	U		25
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1-Dichloroethane	µg/l	360	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1-Dichloroethene	µg/l	7	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,2-Dichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,2-Dichloropropane	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dioxane	µg/l	4	< 1.6	U		1.6	< 1.6	U	U	1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U	U	10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U	U	10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Benzene	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Carbon tetrachloride	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Chloroform	µg/l	80	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
cis/trans 1,2-Dichloroethene	µg/l	---	< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U	J-	1.0
Ethyl benzene	µg/l	700	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Ethyl methacrylate	µg/l	260	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
n-Propylbenzene	µg/l	52	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Styrene	µg/l	100	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrachloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrahydrofuran	µg/l	227	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Toluene	µg/l	1000	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Trichloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Vinyl Chloride	µg/l	2	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2.0	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0

Parameter	MW-1S 2015-05-11				MW-1S 2015-10-27				MW-1S 2017-03-28				MW-1S 2017-06-28			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.61				0.58				0.46				0.43			
Iron, Ferrous	1				1				1.5				0			
Oxidation Reduction Potential	208.2				135.6				146.1				226.5			
pH	9.57				5.65				5.55				6			
Specific Conductance	78				76				80				226.6			
Temperature	10.34				12.21				6.54				11.61			
Turbidity, field	4.01				20.3				30.3				485			
Metals																
Antimony	< 1.0	U		1	< 1.0	U		1								
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1								
Arsenic	2.8			1	54.6			1	14.9			1.0	521			1.0
Arsenic, dissolved	1.2			1	1.4			1	1.5			1.0	2.7			1.0
Beryllium	0.35	J		0.7	0.27	J		0.7								
Beryllium, dissolved	0.35	J		0.7	0.05	J		0.7								
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5								
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5								
Chromium	< 4.0	U		0.004	1	J		0.004								
Chromium, dissolved	< 4.0	U		0.004	< 4.0	U		0.004								
Lead	< 5.0	U		0.005	< 5.0	U		0.005								
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005								
Manganese	44			0.003	160			0.003	170			0.0030	268			3.0
Manganese, dissolved	49	B		0.003	150			0.003	170			0.0030	222			3.0
Selenium	< 15	U		0.015	< 15	U		0.015								
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015								
Silver	< 3.0	U		0.003	< 3.0	U		0.003								
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003								
Thallium	< 0.20	U		0.2	0.014	J		0.2								
Thallium, dissolved	< 0.20	U		0.2	< 0.20	U		0.2								
Zinc	< 10	UJ		0.01	2.7	J		0.01								
Zinc, dissolved	3.8	J		0.01	3	J		0.01								
Semi Volatile Organic Compounds																
2-Methylphenol	< 23	*U		23	< 5.1	U		5.1								
bis(2-Ethylhexyl) phthalate	< 23	UJ		23	< 5.1	U		5.1								
Naphthalene	< 23	UJ		23	< 5.1	U		5.1								
N-Nitrosodibutylamine	< 47	*U		47	< 10	UJ		10								
N-Nitrosopyrrolidine	< 47	*U		47	< 10	UJ		10								
o-Toluidine	< 47	*U		47	< 10	UJ		10								
Phenol	< 23	*U		23	< 5.1	U		5.1								
Pyridine	< 120	U		120	< 26	U		26								
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
1,4-Dioxane	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U	U	1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
cis/trans 1,2-Dichloroethene									< 2.0	U		2.0	< 2.0	U	U	2.0
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1.0	< 1.0	U	U	1.0
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	0.46	J	J	1.0
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U	U	2.0

Parameter	MW-1S 2017-08-07				MW-1S 2017-08-08				MW-1S 2017-10-11				MW-22B 2011-09-19				MW-22B 2012-03-30			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	NA				0.49				NA				0.61				0.88			
Iron, Ferrous	NA				0				NA				1.1				0.07			
Oxidation Reduction Potential	NA				53.9				NA				-101.9				-266.3			
pH	NA				7.01				NA				6.96				7.3			
Specific Conductance	NA				215				NA				176				21			
Temperature	NA				13.44				NA				12.4				9.57			
Turbidity, field	NA				46.6				NA				13.9				9.86			
Metals																				
Antimony													< 1.0	U		1	< 1.0	U		1
Antimony, dissolved													< 1.0	U		1	< 1.0	U		1
Arsenic	132			1.0					40.8			1.0	15.2			1	4.4			1
Arsenic, dissolved	0.54	J		1.0					4.0			1.0	10.4			1	1.5			1
Beryllium													0.076	J		0.7	< 0.70	U		0.7
Beryllium, dissolved													< 0.70	U		0.7	< 0.70	U		0.7
Cadmium													< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved													< 0.50	U		0.5	< 0.50	U		0.5
Chromium													< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved													< 4.0	U		0.004	< 4.0	U		0.004
Lead													< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved													< 5.0	U		0.005	< 5.0	U		0.005
Manganese	344	B		3.0					426			3.0	230			0.003	71			0.003
Manganese, dissolved	310	B		3.0					392	B		3.0	200			0.003	32			0.003
Selenium													< 15	U		0.015	< 15	U		0.015
Selenium, dissolved													< 15	U		0.015	< 15	U		0.015
Silver													< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved													< 3.0	U		0.003	< 3.0	U		0.003
Thallium													0.019	J		0.2	< 0.20	U		0.2
Thallium, dissolved													0.0084	J		0.2	< 0.20	U		0.2
Zinc													< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved													< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol									< 5.0	U		5.0	< 5.4	U		5.4	< 5.0	U		5
bis(2-Ethylhexyl) phthalate									< 5.0	U		5.0	< 5.4	U		5.4	< 5.0	U		5
Naphthalene									< 5.0	U		5.0	< 5.4	U		5.4	< 5.0	U		5
N-Nitrosodibutylamine									< 10	U		10	< 11	UJ		11	< 9.9	U		9.9
N-Nitrosopyrrolidine									< 10	U		10	< 11	UJ		11	< 9.9	U		9.9
o-Toluidine									< 10	U		10	< 11	UJ		11	< 9.9	U		9.9
Phenol									< 5.0	U		5.0	< 5.4	U		5.4	< 5.0	U		5
Pyridine									< 25	U		25	< 27	U		27	< 25	U		25
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	< 1.6	U		1.6					< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	< 10	U		10					< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10					< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5.0					< 5.0	U		5.0	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	< 2.0	U		2.0					< 2.0	U		2.0								
cis-1,2-Dichloroethene	< 1.0	U		1.0					< 1.0	U		1.0	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1.0					< 1.0	U	J-	1.0	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	0.50	J		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5.0					< 5.0	U		5.0	< 5.0	U		5	< 5.0	U		5
Toluene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1.0					< 1.0	U		1.0	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2.0					< 2.0	U		2.0	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrai
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-22B 2012-09-26				MW-22B 2013-03-22				MW-22B 2013-09-24				MW-22B 2014-05-06				MW-22B 2014-10-03				MW-22B 2015-05-07				MW-22B 2015-10-27			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																														
Dissolved Oxygen	mg/l	---	NA				0.24				1.17				1.44				0.5				1.29				0.34			
Iron, Ferrous	mg/l	---	NA				0.19				0.17								0.5				0.25				1.5			
Oxidation Reduction Potential	mV	---	NA				-58.6				-15				25.6				-34.2				218.9				62.1			
pH	SU	---	NA				7.3				7.09				7.16				6.91				7.06				7.33			
Specific Conductance	µs/cm	---	NA				153				173				293				136				149				116			
Temperature	CELSIUS	---	NA				8.32				13.9				10.35								12.21				9.87			
Turbidity, field	NTU	---	NA				11.8				34				3.97				3.8				4.5				3.9			
Metals																														
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					< 1.0	U		1	< 1.0	U		1	0.16	J		1
Antimony, dissolved	µg/l	6	< 1.0	U		1					< 1.0	U		1					< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	6.2			1	5.5			1	14.7			1					2.3			1	3.1			1	7.4			1
Arsenic, dissolved	µg/l	10	5.5			1					1.6			1					1.3	B		1	1.5			1	7.1			1
Beryllium	µg/l	4	0.037	J		0.7	0.033	J		0.7	0.13	J		0.7					< 0.70	U		0.7	< 0.70	^U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7					< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	U		0.004					< 4.0	U		0.004					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005					< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	180			0.003	140			0.003	330			0.003					52			0.003	43	B		0.003	150			0.003
Manganese, dissolved	µg/l	300	160			0.003					19			0.003					17			0.003	2.4	J		0.003	140			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2	0.019	J		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2					< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	U		0.01	2.3	J		0.01	4.6	J		0.01					< 10	^U		0.01	< 10	UJ		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01					< 10	U		0.01					< 10	U		0.01	1.6	J		0.01	2.3	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																													
2-Methylphenol	µg/l	540	< 4.7	U		4.7	< 4.8	U		4.8	< 3.8	U		3.8	< 4.6	U		4.6	< 5.0	U		5	< 4.6	U		4.6	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	U		4.7	< 4.8	*U		4.8	< 3.8	U		3.8	< 4.6	U		4.6	< 5.0	U		5	< 4.6	U		4.6	< 4.8	U		4.8
Naphthalene	µg/l	100	< 4.7	U		4.7	< 4.8	U		4.8	< 3.8	U		3.8	< 4.6	U		4.6	< 5.0	U		5	< 4.6	U		4.6	< 4.8	U		4.8
N-Nitrosodibutylamine	µg/l	0.003	< 9.5	U		9.5	< 9.7	U		9.7	< 7.7	*U		7.7	< 9.1	U		9.1	< 9.9	U		9.9	< 9.2	U		9.2	< 9.6	UJ		9.6
N-Nitrosopyrrolidine	µg/l	0.03	< 9.5	U		9.5	< 9.7	U		9.7	< 7.7	*U		7.7	< 9.1	UJ		9.1	< 9.9	U		9.9	< 9.2	U		9.2	< 9.6	UJ		9.6
o-Toluidine	µg/l	0.2	< 9.5	U		9.5	< 9.7	U		9.7	< 7.7	U		7.7	< 9.1	UJ		9.1	< 9.9	U		9.9	< 9.2	U		9.2	< 9.6	UJ		9.6
Phenol	µg/l	2000	< 4.7	U		4.7	< 4.8	U		4.8	< 3.8	U		3.8	< 4.6	U		4.6	< 5.0	U		5	< 4.6	U		4.6	< 4.8	U		4.8
Pyridine	µg/l	9	< 24	U		24	< 24	U		24	< 19	U		19	< 23	U		23	< 25	U		25	< 23	U		23	< 24	U		24
Volatile Organic Compounds																														
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	2	J		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	4.4	J		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																												
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	0.93	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	*U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	9.2			1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	3.7			2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-22M 2011-09-19				MW-22M 2012-03-30				MW-22M 2012-09-26				MW-22M 2013-03-22				MW-22M 2013-09-24				MW-22M 2014-05-06			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																										
Dissolved Oxygen	mg/l	---	1.33				0.41				NA				0.24				1.3				0.54			
Iron, Ferrous	mg/l	---	7.3				2.73				NA				2.73				1.71				2			
Oxidation Reduction Potential	mV	---	-29.6				-262.1				NA				-116.2				-84				-149.2			
pH	SU	---	6.29				6.85				NA				6.65				6.63				6.45			
Specific Conductance	µs/cm	---	1183				143				NA				2316				1702				1425			
Temperature	CELSIUS	---	12.56				9.11				NA				9.04				13.9				9.55			
Turbidity, field	NTU	---	3.58				15.6				NA				3.64				4.5				3.2			
Metals																										
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	1.5			1	1.6			1	0.86	J		1				
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1	1.4			1					0.85	J		1				
Arsenic	µg/l	10	132	J		1	122			1	139			1	285			1	95.7			1				
Arsenic, dissolved	µg/l	10	153	J		1	140			1	136			1					95.5			1				
Beryllium	µg/l	4	< 0.70	U		0.7	0.038	J		0.7	0.045	J		0.7	0.05	J		0.7	< 0.70	U		0.7				
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7	0.038	J		0.7					< 0.70	U		0.7				
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	0.02	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5				
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5				
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	2.2	J		0.004	1.9	J		0.004	1.3	J		0.004				
Chromium, dissolved	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	2.2	J		0.004					1.2	J		0.004				
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005				
Manganese	µg/l	300	3200			0.003	3200			0.003	3400			0.003	1700			0.003	2800			0.003				
Manganese, dissolved	µg/l	300	3100			0.003	3300			0.003	3200			0.003					2600			0.003				
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015				
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003				
Thallium	µg/l	2	0.32			0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Thallium, dissolved	µg/l	2	0.21			0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2				
Zinc	µg/l	2000	< 10	U		0.01	5	J		0.01	5.6	J		0.01	3.6	J		0.01	5.5	J		0.01				
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	12			0.01					3.7	J		0.01				
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																									
2-Methylphenol	µg/l	540	< 4.8	U		4.8	< 4.7	U		4.7	0.55	J		4.8	< 5.0	U		5	< 3.9	U		3.9	< 4.6	U		4.6
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.8	U		4.8	< 4.7	U		4.7	1.7	J		4.8	< 5.0	*U		5	< 3.9	U		3.9	< 4.6	U		4.6
Naphthalene	µg/l	100	< 4.8	U		4.8	0.9	J		4.7	2	J		4.8	3.2	J		5	< 3.9	U		3.9	0.82	J		4.6
N-Nitrosodibutylamine	µg/l	0.003	< 9.6	UJ		9.6	< 9.5	U		9.5	< 9.6	U		9.6	< 9.9	U		9.9	< 7.8	*U		7.8	< 9.2	U		9.2
N-Nitrosopyrrolidine	µg/l	0.03	< 9.6	UJ		9.6	< 9.5	U		9.5	< 9.6	U		9.6	< 9.9	U		9.9	< 7.8	*U		7.8	< 9.2	UJ		9.2
o-Toluidine	µg/l	0.2	< 9.6	UJ		9.6	< 9.5	U		9.5	2.6	J		9.6	< 9.9	U		9.9	< 7.8	U		7.8	< 9.2	UJ		9.2
Phenol	µg/l	2000	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 3.9	U		3.9	< 4.6	U		4.6
Pyridine	µg/l	9	< 24	U		24	< 24	U		24	< 24	U		24	< 25	U		25	< 20	U		20	< 23	U		23
Volatile Organic Compounds																										
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
1,1-Dichloroethane	µg/l	360	0.78	J		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
1,2-Dichloroethane	µg/l	5	1.2			1	1.9	J		2	2.1			2	1.2			1	< 2.0	U		2	< 10	U		10
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	2.4			1	< 2.0	U		2	< 10	U		10
1,4-Dioxane	µg/l	4	23			1.6	38			1.6	80	J		1.6	190			16	140			16	110			16
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 20	U		20	< 20	U		20	10			10	< 20	U		20	< 100	U		100
Acetone	µg/l	5600	< 10	U		10	< 20	U		20	11	J		20	26			10	21			20	< 100	U		100
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 10	U		10	< 10	U		10	< 5.0	U		5	< 10	U		10	< 50	U		50
Benzene	µg/l	5	0.87	J		1	8.8			2	14			2	32			1	10			2	16			10
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
Chloroform	µg/l	80	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
cis/trans 1,2-Dichloroethene	µg/l	---																								
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	2.1	J		4	< 4.0	U		4	2.6			2	< 4.0	U		4	< 20	U		20
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 2.0	U		2	1.1	J		2	1.2			1	< 2.0	U		2	< 10	U		10
Ethyl benzene	µg/l	700	6.4			1	68			2	58			2	220			20	36			2	62			10
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
n-Propylbenzene	µg/l	52	0.86	J		1	18			2	28			2	64			1	4.9			2	12			10
Styrene	µg/l	100	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
Tetrahydrofuran	µg/l	227	220			5	510			10	880			10	4100			100	1900			50	51	*		50
Toluene	µg/l	1000	< 1.0	U		1	1	J		2	< 2.0	U		2	0.57	J		1	7.2			2	< 10	U		10
Trichloroethene	µg/l	5	< 1.0	U		1	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
Vinyl Chloride	µg/l	2	< 1.0	U		1	2.5			2	< 2.0	U		2	< 1.0	U		1	< 2.0	U		2	< 10	U		10
Xylenes (unspecified)	µg/l	10000	2.3			2	130			4	180			4	2500			40	7			4	98			20

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group: Downgradient Groundwater Area Including GSA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-22M 2014-10-03 Result	LQual	VQual	RL	MW-22M 2015-05-07 Result	LQual	VQual	RL	MW-22M 2015-10-27 Result	LQual	VQual	RL	MW-24M 2011-09-21 Result	LQual	VQual	RL	MW-24M 2012-03-27 Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.58				0.15				0.09				0.63				0.36			
Iron, Ferrous	mg/l	---	3.5				2.5				3				< 0.50	U		0.5				
Oxidation Reduction Potential	mV	---	-98.9				-3				-29.8				224.1				210.1			
pH	SU	---	6.23				6.41				6.39				5.49				5.75			
Specific Conductance	µs/cm	---	1386				1420				1221				455				37			
Temperature	CELSIUS	---					8				10.36				13.2				11.32			
Turbidity, field	NTU	---	4.01				3.1				4				4.73				0.3			
Metals																						
Antimony	µg/l	6	1.8			1	1.3			1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6	1.8			1	1.3			1	0.89	J		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	150			1	114			1	358			1	< 1.0	U		1	< 1.0	U		1
Arsenic, dissolved	µg/l	10	130	B		1	129			1	366			1	0.57	J		1	0.28	J		1
Beryllium	µg/l	4	0.083	J		0.7	0.034	J		0.7	< 0.70	UJ		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4	0.047	J		0.7	0.044	J		0.7	0.038	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	< 4.0	UJ		0.004	< 4.0	UJ		0.004	1.4	J		0.004	0.99	J		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	2.6	J		0.004	1.3	J		0.004	1.2	J		0.004	0.93	J		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	4	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	1900			0.003	2300	B		0.003	1400			0.003	390			0.003	650			0.003
Manganese, dissolved	µg/l	300	2300			0.003	2200			0.003	1400			0.003	360			0.003	620			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	0.037	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2	0.14	J		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	0.16	J		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	U		0.01	< 10	U		0.01	2.3	J		0.01	< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	6.1	J		0.01	3.4	J		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																					
2-Methylphenol	µg/l	540	< 5.0	U		5	< 4.8	U		4.8	< 5.2	U		5.2	< 4.7	U		4.7	< 4.7	U		4.7
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.0	U		5	< 4.8	U		4.8	< 5.2	U		5.2	< 4.7	U		4.7	< 4.7	U		4.7
Naphthalene	µg/l	100	2.4	J		5	1.9	J		4.8	2.6	J		5.2	< 4.7	U		4.7	< 4.7	U		4.7
N-Nitrosodibutylamine	µg/l	0.003	< 10	U		10	< 9.5	U		9.5	< 10	UJ		10	< 9.4	UJ		9.4	< 9.4	U		9.4
N-Nitrosopyrrolidine	µg/l	0.03	< 10	U		10	< 9.5	U		9.5	< 10	UJ		10	< 9.4	UJ		9.4	< 9.4	U		9.4
o-Toluidine	µg/l	0.2	< 10	U		10	< 9.5	U		9.5	3.4	J		10	< 9.4	UJ		9.4	< 9.4	U		9.4
Phenol	µg/l	2000	< 5.0	U		5	< 4.8	U		4.8	< 5.2	U		5.2	< 4.7	U		4.7	< 4.7	U		4.7
Pyridine	µg/l	9	< 25	U		25	< 24	U		24	< 26	U		26	< 24	U		24	< 24	U		24
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	88			16	110			16	240			6.4	< 3.2	U		3.2	2.4	J		3.2
2-Butanone (MEK)	µg/l	4000	< 800	U		800	< 400	U		400	< 400	U		400	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 800	U		800	< 400	U		400	< 400	U		400	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 400	U		400	< 200	U		200	< 200	U		200	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 80	U		80	< 40	U		40	26	J		40	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 80	U		80	< 40	U		40	< 40	U		40	0.56	J		1	0.44	J		1
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	< 160	U		160	< 80	U		80	< 80	U		80	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	250			80	46			40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	69	J		80	< 40	U		40	43			40	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	2700			400	2900			200	1800			200	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 80	U		80	< 40	U		40	< 40	U		40	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	1700			160	160			80	900			80	< 2.0	U		2	< 2.0	U		2

Parameter	MW-24M 2012-09-20 Result	LQual	VQual	RL	MW-24M 2013-03-25 Result	LQual	VQual	RL	MW-24M 2013-09-26 Result	LQual	VQual	RL	MW-24M 2014-05-05 Result	LQual	VQual	RL	MW-24M 2014-10-03 Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	NA				0.46				2.67				1.65				10.29			
Iron, Ferrous	NA				0.02															
Oxidation Reduction Potential	NA				95				158				55				217.9			
pH	NA				5.71				5.84				5.33				5.95			
Specific Conductance	NA				504				422				344				51			
Temperature	NA				9.78				14.8				10.28				14.19			
Turbidity, field	NA				3.34				2.4				0.69				0.61			
Metals																				
Antimony	1.6			1	< 1.0	U		1	1.2	J		1					0.85	J		1
Antimony, dissolved	1.6			1					1.3			1					0.33	J		1
Arsenic	0.59	J		1	< 1.0	U		1	< 1.0	U		1					8.5			1
Arsenic, dissolved	0.52	J		1					< 1.0	U		1					< 1.0	U		1
Beryllium	< 0.70	U		0.7	0.058	J		0.7	< 0.70	U		0.7					0.53	J		0.7
Beryllium, dissolved	< 0.70	U		0.7					< 0.70	U		0.7					< 0.70	U		0.7
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	UJ		0.5					0.53			0.5
Cadmium, dissolved	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5
Chromium	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	U		0.004
Chromium, dissolved	< 4.0	U		0.004					< 4.0	U		0.004					< 4.0	U		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	*U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005					< 5.0	U		0.005					< 5.0	U		0.005
Manganese	630			0.003	620	B		0.003	560			0.003					3.4			0.003
Manganese, dissolved	650			0.003					550			0.003					1.8	J		0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Selenium, dissolved	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	UJ		0.2					0.52			0.2
Thallium, dissolved	< 0.20	U		0.2					0.034	J		0.2					< 0.20	U		0.2
Zinc	< 10	U		0.01	< 10	UJ		0.01	< 10	U		0.01					< 10	U		0.01
Zinc, dissolved	< 10	U		0.01					< 10	U		0.01					< 10	U		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5
bis(2-Ethylhexyl) phthalate	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	*U		5	< 4.7	U		4.7	< 5.0	U		5
Naphthalene	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5
N-Nitrosodibutylamine	< 9.4	U		9.4	< 9.5	U		9.5	< 10	U		10	< 9.3	U		9.3	< 10	U		10
N-Nitrosopyrrolidine	< 9.4	U		9.4	< 9.5	U		9.5	< 10	UJ		10	< 9.3	UJ		9.3	< 10	U		10
o-Toluidine	< 9.4	U		9.4	< 9.5	U		9.5	< 10	UJ		10	< 9.3	UJ		9.3	< 10	U		10
Phenol	< 4.7	U		4.7	< 4.8	U		4.8	< 5.0	U		5	< 4.7	U		4.7	< 5.0	U		5
Pyridine	< 24	U		24	< 24	U		24	< 25	U		25	< 23	U		23	< 25	U		25
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane					< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	< 1.0	U		1	0.56	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene																				
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	*U		5	< 5.0	U		5
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Parameter	MW-24M 2015-05-07 Result	LQual	VQual	RL	MW-24M 2015-10-26 Result	LQual	VQual	RL	MW-24M 2017-03-29 Result	LQual	VQual	RL
Field Parameters												
Dissolved Oxygen	0.81				1.9				2.26			
Iron, Ferrous					1.5							
Oxidation Reduction Potential	192.9				174.3				155.1			
pH	5.43				5.94				5.92			
Specific Conductance	284				292				383			
Temperature	11.25				11.91				9.52			
Turbidity, field	0.71				0.77				9.4			
Metals												
Antimony	0.41	J		1	0.68	J		1				
Antimony, dissolved	0.42	J		1	0.66	J		1				
Arsenic	< 1.0	U		1	0.4	J		1	0.67	J		1.0
Arsenic, dissolved	< 1.0	U		1	0.32	J		1	0.32	J		1.0
Beryllium	0.074	J		0.7	0.049	J		0.7				
Beryllium, dissolved	0.063	J		0.7	< 0.70	U		0.7				
Cadmium	< 0.50	U		0.5	0.074	J		0.5				
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5				
Chromium	< 4.0	U		0.004	< 4.0	U		0.004				
Chromium, dissolved	< 4.0	U		0.004	< 4.0	U		0.004				
Lead	< 5.0	U		0.005	< 5.0	U		0.005				
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005				
Manganese	350	B		0.003	110	B		0.003	240			0.0030
Manganese, dissolved	330	B		0.003	92			0.003	110			0.0030
Selenium	< 15	U		0.015	< 15	U		0.015				
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015				
Silver	< 3.0	U		0.003	< 3.0	U		0.003				
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	< 0.20	U		0.2	0.022	J		0.2				
Thallium, dissolved	< 0.20	U		0.2	0.026	J		0.2				
Zinc	< 10	U		0.01	< 10	U		0.01				
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds												
2-Methylphenol	< 50	U		50	< 4.7	U		4.7				
bis(2-Ethylhexyl) phthalate	< 50	U		50	< 4.7	U		4.7				
Naphthalene	< 50	U		50	< 4.7	U		4.7				
N-Nitrosodibutylamine	< 99	U		99	< 9.4	UJ		9.4				
N-Nitrosopyrrolidine	< 99	U		99	< 9.4	UJ		9.4				
o-Toluidine	< 99	U		99	< 9.4	UJ		9.4				
Phenol	< 50	U		50	< 4.7	U		4.7				
Pyridine	< 250	U		250	< 24	U		24				
Volatile Organic Compounds												
1,1,1-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,1,2-Trichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,1-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,1-Dichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,2-Dichloroethane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,2-Dichloropropane	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,4-Dichlorobenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
1,4-Dioxane	< 1.6	U		1.6	< 1.6	U		1.6	< 1.6	U		1.6
2-Butanone (MEK)	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0
Benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Carbon tetrachloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Chloroform	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
cis/trans 1,2-Dichloroethene									< 2.0	U		2.0
cis-1,2-Dichloroethene	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1.0
Dichloromethane (Methylene chloride)	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Ethyl benzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Ethyl methacrylate	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
n-Propylbenzene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Styrene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Tetrachloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Tetrahydrofuran	< 5.0	U		5	< 5.0	U		5	< 5.0	U	UJ	5.0
Toluene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Trichloroethene	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Vinyl Chloride	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0
Xylenes (unspecified)	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2.0

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

		Group	Downgradient Groundwater Area Including GSA												Northern Landfill Lobe and FDDA															
		Sample ID	MW-24M				MW-24M				MW-24M				GP-3				GP-3				GP-3				GP-3			
		Date	2017-06-30				2017-08-08				2017-10-11				2017-03-28				2017-06-29				2017-08-07				2017-10-12			
Parameter	Units	Groundwater Performance Standards (μg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																														
Dissolved Oxygen	mg/l	---	0.8				0.22				0.43				1				12.03				0.13				4.4			
Iron, Ferrous	mg/l	---	0				0				0				4.5				1.5				4				2.5			
Oxidation Reduction Potential	mV	---	153				154.3				256.6				-4.2				417.9				-72.9				-86.1			
pH	SU	---	5.37				5.44				5.59				6.48				3.39				6.39				6.3			
Specific Conductance	μs/cm	---	457				404				366				1263				1368				1412				2422			
Temperature	CELSIUS	---	13.53				13.92				14.09				8.15				14.61				16.34				16.43			
Turbidity, field	NTU	---	4.19				1.94				10.1				8.89				13.8				3.5				2.4			
Metals																														
Antimony	μg/l	6																												
Antimony, dissolved	μg/l	6																												
Arsenic	μg/l	10	0.48	J	J	1.0	0.27	J		1.0	0.63	J		1.0	39.7			1.0	14.2			1.0	66.2			1.0	102			1.0
Arsenic, dissolved	μg/l	10	0.34	J	J	1.0	0.31	J		1.0	0.46	J		1.0	36.5			1.0	25.4	F1	F1 J	1.0	60.4			1.0	111			1.0
Beryllium	μg/l	4																												
Beryllium, dissolved	μg/l	4																												
Cadmium	μg/l	5																												
Cadmium, dissolved	μg/l	5																												
Chromium	μg/l	100																												
Chromium, dissolved	μg/l	100																												
Lead	μg/l	15																												
Lead, dissolved	μg/l	15																												
Manganese	μg/l	300	376			3.0	352	B		3.0	233			3.0	1300			0.0030	1530			3.0	1670	B		3.0	1880			3.0
Manganese, dissolved	μg/l	300	295			3.0	341			3.0	191	B		3.0	1400			0.0030	1540			3.0	1580	B		3.0	1940	B		3.0
Selenium	μg/l	50																												
Selenium, dissolved	μg/l	50																												
Silver	μg/l	100																												
Silver, dissolved	μg/l	100																												
Thallium	μg/l	2																												
Thallium, dissolved	μg/l	2																												
Zinc	μg/l	2000																												
Zinc, dissolved	μg/l	2000																												
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																													
2-Methylphenol	μg/l	540									< 5.0	U		5.0													< 25	U		25
bis(2-Ethylhexyl) phthalate	μg/l	6									< 5.0	U		5.0													< 25	U		25
Naphthalene	μg/l	100									< 5.0	U		5.0													< 25	U		25
N-Nitrosodibutylamine	μg/l	0.003									< 10	U		10													< 50	U		50
N-Nitrosopyrrolidine	μg/l	0.03									< 10	U		10													< 50	U		50
o-Toluidine	μg/l	0.2									< 10	U		10													< 50	U		50
Phenol	μg/l	2000									< 5.0	U		5.0													< 25	U		25
Pyridine	μg/l	9									< 25	U		25													< 130	U		130
Volatile Organic Compounds																														
1,1,1-Trichloroethane	μg/l	200	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1,2-Trichloroethane	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1-Dichloroethane	μg/l	360	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1-Dichloroethene	μg/l	7	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,2-Dichloroethane	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,2-Dichloropropane	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,4-Dichlorobenzene	μg/l	75	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,4-Dioxane	μg/l	4	< 1.6	U	U	1.6	< 1.6	U		1.6	< 1.6	U		1.6	17	*		1.6	21		J	1.6	34			1.6	80			16
2-Butanone (MEK)	μg/l	4000	< 10	U	U	10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10	< 40	U		40	< 40	U		40
Acetone	μg/l	5600	< 10	U	U	10	< 10	U		10	< 10	U		10	3.4	J		10	5.5	J	JR	10	< 40	U		40	< 40	U		40
Acrylonitrile	μg/l	0.05	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U		5.0	< 5.0	U	U	5.0	< 20	U		20	< 20	U		20
Benzene	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	2.9			1.0	2.5			1.0	3.4	J		4.0	2.8	J		4.0
Carbon tetrachloride	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Chloroform	μg/l	80	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
cis/trans 1,2-Dichloroethene	μg/l	---	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U	U	2.0	< 8.0	U		8.0	< 8.0	U		8.0
cis-1,2-Dichloroethene	μg/l	70	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Dichloromethane (Methylene chloride)	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U	J-	1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Ethyl benzene	μg/l	700	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Ethyl methacrylate	μg/l	260	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U F1	U F1	1.0	< 4.0	U		4.0	< 4.0	U		4.0
n-Propylbenzene	μg/l	52	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Styrene	μg/l	100	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Tetrachloroethene	μg/l	5	< 1.0	U*	U*	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Tetrahydrofuran	μg/l	227	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0	19			5.0	19		J	5.0	36			20	57			20
Toluene	μg/l	1000	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Trichloroethene	μg/l	5	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Vinyl Chloride	μg/l	2	< 1.0	U	U	1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Xylenes (unspecified)	μg/l	10000	< 2.0	U	U	2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U	U	2.0	< 8.0	U		8.0	< 8.0	U		8.0

Sample ID	GP-5R				GP-5R				GP-5R				GP-5R				GP-7				GP-7				GP-7			
Date	2017-03-29				2017-06-28				2017-08-08				2017-10-13				2011-09-12				2012-03-28				2012-09-27			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																												
Dissolved Oxygen	0.47				2.39				0.21				0.42				1.03				1.95				NA			
Iron, Ferrous					7				3.5				1.5				6.3				3.3				NA			
Oxidation Reduction Potential	-76.9				-31.3				-85.2				-88.8				-114				-85.4				NA			
pH	6.9				5.97				6.93				6.25				6.51				6.64				NA			
Specific Conductance	1425				666				812				1615				3118				318				NA			
Temperature	8.24				13.84				15.15				14.13				13.57				10.06				NA			
Turbidity, field	1.17				29.4				9.17				5.26				2.7				0.76				NA			
Metals																												
Antimony																	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved																	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Arsenic	329			1.0	181			1.0	184			1.0	260			1.0	391			1	410			1	452			1
Arsenic, dissolved	309			1.0	172			1.0	192			1.0	286			1.0	405			1	404			1	440			1
Beryllium																	< 0.70	U		0.7	< 0.70	U		0.7	0.036	J		0.7
Beryllium, dissolved																	< 0.70	U		0.7	< 0.70	U		0.7	0.032	J		0.7
Cadmium																	< 0.50	UL		0.5	< 0.50	UJ		0.5	< 0.50	U		0.5
Cadmium, dissolved																	< 0.50	UL		0.5	< 0.50	UJ		0.5	< 0.50	U		0.5
Chromium																	2.8	J		0.004	3.8	J		0.004	4.4			0.004
Chromium, dissolved																	3.1	J		0.004	2.5	J		0.004	4.5			0.004
Lead																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	660			0.0030	398			3.0	277	B		3.0	906			3.0	1500			0.003	1300			0.003	1300			0.003
Manganese, dissolved	620			0.0030	302			3.0	274	B		3.0	882	B		3.0	1500			0.003	1300			0.003	1300			0.003
Selenium																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium																	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved																	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc																	11			0.01	1.8	J		0.01	1.8	J		0.01
Zinc, dissolved																	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds																												
2-Methylphenol													< 25	U		25	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate													< 25	U		25	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
Naphthalene													< 25	U		25	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
N-Nitrosodibutylamine													< 50	U		50	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.6	U		9.6
N-Nitrosopyrrolidine													< 50	U		50	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.6	U		9.6
o-Toluidine													< 50	U		50	< 9.5	UJ		9.5	39			9.4	59			9.6
Phenol													< 25	U		25	< 4.8	U		4.8	< 4.7	U		4.7	< 4.8	U		4.8
Pyridine													< 130	U		130	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																												
1,1,1-Trichloroethane	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
1,1,2-Trichloroethane	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
1,1-Dichloroethane	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	0.59	J		1
1,1-Dichloroethene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
1,2-Dichloroethane	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
1,2-Dichloropropane	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
1,4-Dichlorobenzene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	4.2			1	4.2			2	4.1			1
1,4-Dioxane	63		J	3.2	56			3.2	48			3.2	89			16	310			32	400			16	380	J		32
2-Butanone (MEK)	< 40	U	J	40	< 40	U	U	40	< 40	U		40	< 40	U		40	< 10	U		10	< 20	U		20	< 10	U		10
Acetone	< 40	U	J	40	< 40	U	U	40	< 40	U		40	12	J		40	11			10	20	J		20	5.6	J		10
Acrylonitrile	< 20	U	J	20	< 20	U	U	20	< 20	U		20	< 20	U		20	< 5.0	U		5	< 10	U		10	< 5.0	U		5
Benzene	2.6	J	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	3.5	J		4.0	3.9			1	3.3			2	3.5			1
Carbon tetrachloride	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Chloroform	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
cis/trans 1,2-Dichloroethene	< 8.0	U	J	8.0	< 8.0	U	U	8.0	< 8.0	U		8.0	< 8.0	U		8.0												
cis-1,2-Dichloroethene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 2.0	U		2	< 4.0	U		4	< 2.0	U		2
Dichloromethane (Methylene chloride)	< 4.0	U	J	4.0	2.5	J	J	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Ethyl benzene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Ethyl methacrylate	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
n-Propylbenzene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	1.1			1	< 2.0	U		2	0.97	J		1
Styrene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Tetrachloroethene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Tetrahydrofuran	36		J	20	11	J	J	20	15	J		20	67			20	68			5	59			10	96			5
Toluene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Trichloroethene	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Vinyl Chloride	< 4.0	U	J	4.0	< 4.0	U	U	4.0	< 4.0	U		4.0	< 4.0	U		4.0	< 1.0	U		1	< 2.0	U		2	< 1.0	U		1
Xylenes (unspecified)	< 8.0	U	J	8.0	< 8.0	U	U	8.0	< 8.0	U		8.0	< 8.0	U		8.0	< 2.0	U		2	< 4.0	U		4	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (μg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
μg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group: Northern Landfill Lobe and FDDA

Sample ID / Date			GP-7 2013-03-26				GP-7 2013-09-25				GP-7 2014-05-07				GP-7 2014-10-31				GP-7 2015-05-07				GP-7 2015-10-26			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																										
Dissolved Oxygen	mg/l	---	0.2				1.25				0.26				0.2				0.04				0.32			
Iron, Ferrous	mg/l	---	2.26				1.77				1				1.25				2.5				0.5			
Oxidation Reduction Potential	mV	---	-120.4				-79				-129				-95				-74.8				-33.8			
pH	SU	---	6.22				6.86				6.67				6.44				6.57				6.51			
Specific Conductance	µs/cm	---	3806				3739				2935				3151				2946				2814			
Temperature	CELSIUS	---	9.78				14.8				10.31				11.29				10.34				11.48			
Turbidity, field	NTU	---	11.3				4.1				2.99				2.75				0.47				2.41			
Metals																										
Antimony	µg/l	6	< 1.0	U		1	0.45	J		1					0.28	J		1	0.28	J		1	0.33	J		1
Antimony, dissolved	µg/l	6					0.44	J		1					0.43	J		1	0.28	J		1	0.33	J		1
Arsenic	µg/l	10	385			1	428			1					372			1	468			1	427			1
Arsenic, dissolved	µg/l	10					456			1					499			1	424			1	438			1
Beryllium	µg/l	4	< 0.70	U		0.7	0.043	J		0.7					< 1.4	U		1.4	0.04	J		0.7	< 0.70	^U		0.7
Beryllium, dissolved	µg/l	4					0.031	J		0.7					< 1.4	U		1.4	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 1.0	U		1
Chromium	µg/l	100	3.6	J		0.004	4.3			0.004					7			0.004	3.4	J		0.004	3.7	J		0.004
Chromium, dissolved	µg/l	100					4.6			0.004					4.7			0.004	4.3	J		0.004	3.9	J		0.004
Lead	µg/l	15	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005	3.8	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	1500			0.003	1400			0.003					850			0.003	650	B		0.003	1100	B		0.003
Manganese, dissolved	µg/l	300					1300			0.003					800	^		0.003	660	B		0.003	1100			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	UJ		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	^U		0.2
Zinc	µg/l	2000	< 10	U		0.01	2.4	J		0.01					< 10	U		0.01	< 10	UJ		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000					< 10	U		0.01					< 10	U		0.01	34	J		0.01	2.6	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																									
2-Methylphenol	µg/l	540	< 4.8	U		4.8	< 5.0	U		5	3	J		4.6	< 5.0	U		5	< 25	U		25	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6	< 5.0	U		5	< 25	U		25	< 4.8	U		4.8
Naphthalene	µg/l	100	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6	< 5.0	U		5	< 25	U		25	< 4.8	U		4.8
N-Nitrosodibutylamine	µg/l	0.003	< 9.7	U		9.7	< 10	*U		10	< 9.2	UJ		9.2	8.5	J		9.9	< 50	U		50	3.5	J		9.7
N-Nitrosopyrrolidine	µg/l	0.03	< 9.7	U		9.7	< 10	U		10	< 9.2	UJ		9.2	16			9.9	< 50	U		50	< 9.7	UJ		9.7
o-Toluidine	µg/l	0.2	31			9.7	< 10	U		10	< 9.2	UJ		9.2	45			9.9	24	J		50	2.4	J		9.7
Phenol	µg/l	2000	< 4.8	U		4.8	< 5.0	U		5	< 4.6	U		4.6	< 5.0	U		5	< 25	U		25	< 4.8	U		4.8
Pyridine	µg/l	9	< 24	U		24	< 25	U		25	< 23	U		23	< 25	U		25	< 120	U		120	< 24	U		24
Volatile Organic Compounds																										
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,1-Dichloroethane	µg/l	360	0.42	J		1	0.59	J		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
1,4-Dichlorobenzene	µg/l	75	3.6			1	3.2			1	3.7			1	1.2	J		1	< 5.0	U		5	4			4
1,4-Dioxane	µg/l	4	470			16	610			32	350			32	710			16	750	J		16	380			16
2-Butanone (MEK)	µg/l	4000	< 10	U		10	11			10	< 10	U		10	< 10	UJ		10	< 50	U		50	< 40	U		40
Acetone	µg/l	5600	< 10	U		10	15			10	< 10	U		10	< 10	UJ		10	< 50	U		50	< 40	U		40
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	UJ		5	< 25	U		25	< 20	U		20
Benzene	µg/l	5	3.3			1	3.4			1	3.1			1	0.88	J		1	3.7	J		5	3.3	J		4
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
cis/trans 1,2-Dichloroethene	µg/l	---																								
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	UJ		2	< 10	U		10	< 8.0	U		8
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Ethyl benzene	µg/l	700	< 1.0	U		1	0.98	J		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
n-Propylbenzene	µg/l	52	1			1	0.82	J		1	0.78	J		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Tetrahydrofuran	µg/l	227	67			5	79			5	59			5	25	J		5	75			25	57			20
Toluene	µg/l	1000	< 1.0	U		1	5.6			1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	UJ		1	< 5.0	U		5	< 4.0	U		4
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	3.9			2	< 2.0	U		2	< 2.0	UJ		2	< 10	U		10	< 8.0	U		8

Sample ID / Date			GP-7 2017-03-29				GP-7 2017-06-29				GP-7 2017-08-07				GP-7 2017-10-11				MW-2S 2011-09-15				MW-2S 2012-03-29				MW-2S 2012-09-25			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																														
Dissolved Oxygen	mg/l	---	0.29				0.19				0.11				1.49				0.03				0.46				NA			
Iron, Ferrous	mg/l	---	6.5				1.5				1.5				3.5				6.5				0.72				NA			
Oxidation Reduction Potential	mV	---	-92.2				-109.3				-126.1				-94.7				-102.1				-249.2				NA			
pH	SU	---	6.67				6.69				6.68				6.63				6.38				6.81				NA			
Specific Conductance	µs/cm	---	3204				3812				2386				2960				2094				133				NA			
Temperature	CELSIUS	---	8.69				13.31				12.98				12.61				15.56				7.28				NA			
Turbidity, field	NTU	---	385				2.11				5.24				3.95				10.64				9.58				NA			
Metals																														
Antimony	µg/l	6																	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6																	< 1.0	U		1	< 1.0	U		1	0.36	J		1
Arsenic	µg/l	10	433			1.0	403			1.0	421			1.0	398			1.0	470			1	441			1	560			1
Arsenic, dissolved	µg/l	10	432			1.0	411			1.0	365			1.0	443			1.0	452			1	439			1	574			1
Beryllium	µg/l	4																	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4																	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5																	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5																	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100																	2.4	J		0.004	1.5	J		0.004	2	J		0.004
Chromium, dissolved	µg/l	100																	2.3	J		0.004	2.2	J		0.004	2.7	J		0.004
Lead	µg/l	15																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	760			0.0030	912			3.0	829	B		3.0	871	B		3.0	1400			0.003	2000			0.003	960			0.003
Manganese, dissolved	µg/l	300	750			0.0030	897			3.0	852	B		3.0	931	B		3.0	1300			0.003	2000			0.003	980	B		0.003
Selenium	µg/l	50																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2																	0.035	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2																	0.029	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000																	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Zinc, dissolved	µg/l	2000																	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																													
2-Methylphenol	µg/l	540													< 25	U		25	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6													< 25	U		25	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
Naphthalene	µg/l	100													< 25	U		25	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
N-Nitrosodibutylamine	µg/l	0.003													< 50	U		50	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.5	U		9.5
N-Nitrosopyrrolidine	µg/l	0.03													< 50	U		50	< 9.5	UJ		9.5	< 9.4	U		9.4	< 9.5	U		9.5
o-Toluidine	µg/l	0.2													< 50	U		50	< 9.5	UJ		9.5	7	J		9.4	< 9.5	U		9.5
Phenol	µg/l	2000													< 25	U		25	< 4.7	U		4.7	< 4.7	U		4.7	< 4.8	U		4.8
Pyridine	µg/l	9													< 130	U		130	< 24	U		24	< 24	U		24	< 24	U		24
Volatile Organic Compounds																														
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1.0	< 1.0	U	U	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	0.65	J		1.0	0.47	J	J	1.0	0.52	J	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	2.3			1.0	2.1		J	1.0	2.6	J	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	1.2			1	1.1			1
1,4-Dioxane	µg/l	4	330			32	260			6.4	240		J	6.4	170		J	16	57			8	27			8	48	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U	UJ	10	< 10	U	J	10	< 40	U	J	40	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	4.1	J		10	9.0	J	J	10	6.1	J	J	10	< 40	U	J	40	< 10	U		10	10	J		10	4.8	J		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5.0	< 5.0	U	UJ	5.0	< 5.0	U	J	5.0	< 20	U	J	20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	2.3			1.0	2.8		J	1.0	2.7		J	1.0	2.7	J	J	4.0	1.4			1	1.5			1	2.1			1
Carbon tetrachloride	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---	< 2.0	U		2.0	< 2.0	U	UJ	2.0	< 2.0	U	J	2.0	< 8.0	U	J	8.0												
cis-1,2-Dichloroethene	µg/l	70	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	2.1	J	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	69		J	5.0	70		J	5.0	73		J	5.0	63		J	20	41			5	50			5	64			5
Toluene	µg/l	1000	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1.0	< 1.0	U	UJ	1.0	< 1.0	U	J	1.0	< 4.0	U	J	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2.0	< 2.0	U	UJ	2.0	< 2.0	U	J	2.0	< 8.0	U	J	8.0	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Northern Landfill Lobe and FDDA

		Sample ID Date	MW-2S 2013-03-20				MW-2S 2013-09-23				MW-2S 2014-05-06				MW-2SR 2015-10-28				MW-2SR 2017-03-29				MW-2SR 2017-06-29				MW-2SR 2017-08-08				MW-2SR 2017-10-12				MW-7M 2011-09-13				MW-7M 2012-03-26				MW-7M 2012-09-26				MW-7M 2013-03-21				MW-7M 2013-09-23			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																																																						
Dissolved Oxygen	mg/l	---	2.2				1.4				1.02				0.1				0.25				7.19				0.31				1.34				-0.23				0.49				NA				0.2				1.33			
Iron, Ferrous	mg/l	---	1.68				1.85				4.5				1.5				2.75				2.5				6.5				3.0				6.9				1.67				NA				0.56				0.52			
Oxidation Reduction Potential	mV	---	-70.9				-52				-105.3				-41.6				-74.1				140.9				48.2				-87.7				-127				-185.4				NA				-96.4				-55			
pH	SU	---	6.6				6.56				6.43				6.45				6.52				5.61				4.28				6.6				6.53				6.74				NA				6.68				6.61			
Specific Conductance	µs/cm	---	2246				2167				16.37				218				1290				975				1574				1464				1112				1068				NA				1200				1201			
Temperature	CELSIUS	---	6.48				14.1				9.19				12.53				8.1				20.11				14.3				16.51				14.38				8.38				NA				7.8				12.7			
Turbidity, field	NTU	---	11.1				1.7				1.65				4.93				159				208				68.4				9.4				1.32				5.51				NA				4.76				5.2			
Metals																																																						
Antimony	µg/l	6	< 1.0	U		1	0.27	J		1					0.23	J		1																	< 1.0	U		1	0.19	J		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Antimony, dissolved	µg/l	6					0.18	J		1					< 1.0	U		1																	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					0.31	J		1
Arsenic	µg/l	10	517			1	586			1					219	B		1	340			1.0	243			1.0	167			1.0	144			1.0	291			1	325			1	274			1	286			1	248			1
Arsenic, dissolved	µg/l	10					554			1					212			1	259			1.0	30.7			1.0	97.2			1.0	131			1.0	296			1	267			1	245			1					231			1
Beryllium	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7					< 0.70	U		0.7																	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	UJ		0.7
Beryllium, dissolved	µg/l	4					< 0.70	U		0.7					< 0.70	U		0.7																	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					0.03	J		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5																	< 0.50	U		0.5	0.1	J		0.5	0.032	J		0.5	0.018	J		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5					< 0.50	U		0.5																	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Chromium	µg/l	100	1.3	J		0.004	1.8	J		0.004					< 4.0	U		0.004																	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004	1.3	J		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100					1.6	J		0.004					< 4.0	U		0.004																	< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					< 5.0	U		0.005					< 5.0	U		0.005																	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005
Manganese	µg/l	300	1100			0.003	910			0.003					940				2000			0.0030	1510			3.0	1300	B		3.0	2610	B		3.0	2000			0.003	1900			0.003	2000			0.003	2200			0.003	2100			0.003
Manganese, dissolved	µg/l	300					910			0.003					930	B		0.003	2000			0.0030	1440			3.0	1250	B		3.0	2490	B		3.0	2200			0.003	1900			0.003	1900			0.003					2100			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015					< 15	U		0.015																	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003					< 3.0	U		0.003																	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2					0.011	J		0.2																	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	U		0.2					< 0.20	U		0.2																	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Zinc	µg/l	2000	3.5	J		0.01	3.6	J		0.01					< 10	UJ		0.01																	< 10	UJ		0.01	< 10	U		0.01	5.3	J		0.01	3	J		0.01	3.5	J		0.01
Zinc, dissolved	µg/l	2000					6.7	J		0.01					3.9	J		0.01																	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					2.2	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																																																						
2-Methylphenol	µg/l	540	< 4.7	U		4.7	< 4.0	U		4	< 4.8	U		4.8	< 4.7	U		4.7													< 26	U		26	< 4.8	U		4.8	< 49	UH		49	< 4.8	U		4.8	< 4.8	U		4.8	< 3.9	U		3.9
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	*U		4.7	< 4.0	U		4	< 4.8	U		4.8	< 4.7	U		4.7													< 26	U		26	< 4.8	U		4.8	< 49	UH		49	< 4.8	U		4.8	< 4.8	*U		4.8	< 3.9	U		3.9
Naphthalene	µg/l	100	< 4.7	U		4.7	< 4.0	U		4	< 4.8	U		4.8	< 4.7	U		4.7													< 26	U		26	9.6			4.8	9.1	JH		49	16			4.8	9.8			4.8	7.9			3.9
N-Nitrosodibutylamine	µg/l	0.003	< 9.5	U		9.5	< 8.0	*U		8	< 9.5	U		9.5	< 9.4	UJ		9.4													< 51	U		51	< 9.5	UJ		9.5	< 97	UH		97	< 9.6	U		9.6	< 9.6	U		9.6	< 7.8	*U		7.8
N-Nitrosopyrrolidine	µg/l	0.03	< 9.5	U		9.5	< 8.0	*U		8	< 9.5	UJ		9.5	< 9.4	UJ		9.4													< 51	U		51	< 9.5	UJ		9.5	< 97	UH		97	< 9.6	U		9.6	< 9.6	U		9.6	< 7.8	*U		7.8
o-Toluidine	µg/l	0.2	5.5	J		9.5	< 8.0	U		8	< 9.5	UJ		9.5	< 9.4	UJ		9.4													< 51	U		51	< 9.5	UJ		9.5	< 97	UH		97	2	J		9.6	3.9	J		9.6	< 7.8	U		7.8
Phenol	µg/l	2000	< 4.7	U		4.7	< 4.0	U		4	< 4.8	U		4.8	< 4.7	U		4.7													< 26	U		26	< 4.8	U		4.8	< 49	UH		49	< 4.8	U		4.8	< 4.8	U		4.8	< 3.9	U		3.9
Pyridine	µg/l	9	< 24	U		24	< 20	U		20	< 24	U		24	< 23	U		23													< 130	U		130	< 24	U		24	< 240	UH		240	< 24	U		24	< 24	U		24	< 20	U		20
Volatile Organic Compounds																																																							
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	200			40	< 40	U		40	< 40	U		40	< 20	U		20	25			20
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,4-Dichlorobenzene	µg/l	75	1.1			1	0.85	J		1	1.1			1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
1,4-Dioxane	µg/l	4	20	J		1.6	68			1.6	< 3.2	U		3.2	1.3	J		1.6	< 1.6	U		1.6	< 1.6	U	U	1.6	0.73	J		1.6	< 16	U		16	130			3.2	260	J		1.6	240	J		1.6					270	J		16
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U	U	10	< 20	U		20	< 40	U		40	< 10	U		10	< 400	U		400	< 400	U		400	< 200	U		200	< 200	U		200
Acetone	µg/l	5600	3.6	J		10	5	J		10	< 10	U		10	< 10	U		10	4.4	J		10	7.2	J	JR	10	< 20	U		20	14	J		40	< 10	U		10	< 400	U		400	< 400	U		400	< 200	U		200	< 200	U		200
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U	U	5.0	< 10	U		10	< 20	U		20	< 5.0	U		5	< 200	U		200	< 200	U		200	< 100	U		100	< 100	U		100
Benzene	µg/l	5	1.5			1	1.5			1	1.5			1	0.87	J		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	4.2			1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
cis/trans 1,2-Dichloroethene	µg/l	---																	< 2.0	U		2.0	< 2.0	U	U	2.0	< 4.0	U		4.0	< 8.0	U		8.0																				
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 2.0	U		2	< 80	U		80	< 80	U		80	< 40	U		40	< 40	U		40
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	7.9			1	< 40	U		40	< 40	U		40	< 20	U		20	9.6	J		20
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	1500			40	960			40	1600			40	140			20	770			20
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	74			1	79			40	91			40	80			20	62			20
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	13			1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	< 1.0	U		1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Tetrahydrofuran	µg/l	227	52			5	62			5	49	*		5	5.4			5	< 5.0	U	UJ	5.0	< 5.0	U	U	5.0	< 10	U		10	< 20	U		20	460			5	520			200	400			200	500			100	340			100
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	180			40	< 40	U		40	< 40	U		40	< 20	U		20	99			20
Trichloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	1.6			1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U	U	1.0	< 2.0	U		2.0	< 4.0	U		4.0	5.1			1	< 40	U		40	< 40	U		40	< 20	U		20	< 20	U		20
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U	U	2.0	< 4.0	U		4.0	< 8.0	U		8.0	5400			80	4300			80	5200			80	3100			40	3300			40

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group: Northern Landfill Lobe and FDDA Sample ID Date			MW-7M 2014-05-07				MW-7M 2014-10-31				MW-7M 2015-05-11				MW-7M 2015-10-27			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.08				0.2				0.1				0.08			
Iron, Ferrous	mg/l	---	2				2.5				1.5				0.5			
Oxidation Reduction Potential	mV	---	-144.2				-140.1				-56.3				-66.4			
pH	SU	---	6.67				6.55				6.46				6.48			
Specific Conductance	µs/cm	---	1235				1430				848				893			
Temperature	CELSIUS	---	10.74				11.56				10.62				13.16			
Turbidity, field	NTU	---	1.9				1.2				0.68				4.27			
Metals																		
Antimony	µg/l	6					0.38	J		1	0.22	J		1	0.23	J		1
Antimony, dissolved	µg/l	6					0.21	J		1	0.15	J		1	0.22	J		1
Arsenic	µg/l	10					423			1	249			1	248			1
Arsenic, dissolved	µg/l	10					311			1	251			1	248			1
Beryllium	µg/l	4					0.043	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4					< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100					1.8	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100					2.1	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15	< 5.0	U		0.005	3.9	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					3.8	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300					1200			0.003	1700			0.003	1400			0.003
Manganese, dissolved	µg/l	300					1200	^		0.003	1700	B		0.003	1300			0.003
Selenium	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000					< 10	U		0.01	< 10	UJ		0.01	< 10	UJ		0.01
Zinc, dissolved	µg/l	2000					< 10	U		0.01	3.1	J		0.01	2.4	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																	
2-Methylphenol	µg/l	540	< 4.7	U		4.7	< 5.0	U		5	< 110	*U		110	< 5.3	U		5.3
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	U		4.7	< 5.0	U		5	< 110	UJ		110	< 5.3	U		5.3
Naphthalene	µg/l	100	6.5			4.7	5.9			5	< 110	UJ		110	3.2	J		5.3
N-Nitrosodibutylamine	µg/l	0.003	< 9.4	UJ		9.4	< 10	U		10	< 220	*U		220	< 11	UJ		11
N-Nitrosopyrrolidine	µg/l	0.03	< 9.4	UJ		9.4	< 10	U		10	< 220	*U		220	< 11	UJ		11
o-Toluidine	µg/l	0.2	< 9.4	UJ		9.4	< 10	U		10	< 220	*U		220	< 11	UJ		11
Phenol	µg/l	2000	< 4.7	U		4.7	< 5.0	U		5	< 110	*U		110	< 5.3	U		5.3
Pyridine	µg/l	9	< 24	U		24	< 25	U		25	< 540	U		540	< 27	U		27
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,1,2-Trichloroethane	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,1-Dichloroethane	µg/l	360	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,1-Dichloroethene	µg/l	7	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,2-Dichloroethane	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,2-Dichloropropane	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,4-Dichlorobenzene	µg/l	75	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
1,4-Dioxane	µg/l	4	160	J		16	190			16	160			32	80			6.4
2-Butanone (MEK)	µg/l	4000	< 400	U		400	< 400	U		400	< 400	U		400	< 400	U		400
Acetone	µg/l	5600	< 400	U		400	< 400	U		400	< 400	U		400	< 400	U		400
Acrylonitrile	µg/l	0.05	< 200	U		200	< 200	U		200	< 200	U		200	< 200	U		200
Benzene	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Carbon tetrachloride	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Chloroform	µg/l	80	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Dichloromethane (Methylene chloride)	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	19	J		40
Ethyl benzene	µg/l	700	150			40	170			40	55			40	40			40
Ethyl methacrylate	µg/l	260	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
n-Propylbenzene	µg/l	52	71			40	87			40	62			40	42			40
Styrene	µg/l	100	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Tetrachloroethene	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Tetrahydrofuran	µg/l	227	430			200	370			200	210			200	160	J		200
Toluene	µg/l	1000	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Trichloroethene	µg/l	5	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Vinyl Chloride	µg/l	2	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Xylenes (unspecified)	µg/l	10000	2800	J		80	2900			80	1600			80	910			80

Group: Northern Landfill Lobe and FDDA Sample ID Date			MW-7M 2017-03-29				MW-7M 2017-06-29				MW-7S 2011-09-12				MW-7S 2012-03-26				MW-7S 2012-09-26			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.28				0.15				-6.93				0.33				NA			
Iron, Ferrous	mg/l	---	0				0.5				5				2.03				NA			
Oxidation Reduction Potential	mV	---	-79.1				50.3				41				-70.9				NA			
pH	SU	---	6.58				6.65				6.49				6.65				NA			
Specific Conductance	µs/cm	---	1816				1368				722.9				647				NA			
Temperature	CELSIUS	---	6.81				15.14				16.49				6.06				NA			
Turbidity, field	NTU	---	89.4				7.7				4.74				3.11				NA			
Metals																						
Antimony	µg/l	6									< 1.0	U		1	< 1.0	UJ		1	< 1.0	U		1
Antimony, dissolved	µg/l	6									< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Arsenic	µg/l	10	269			1.0	59.3			1.0	21.8			1	24.8	J		1	32.1			1
Arsenic, dissolved	µg/l	10	246			1.0	31.6			1.0	21.6			1	23.3			1	31.9			1
Beryllium	µg/l	4									< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Beryllium, dissolved	µg/l	4									< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	µg/l	5									< 0.50	U		0.5	0.16	J		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5									< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100									2	J		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100									< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	µg/l	15									< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15									< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	1600			0.0030	916			3.0	1300			0.003	1200			0.003	4600			0.003
Manganese, dissolved	µg/l	300	1600			0.0030	908			3.0	1200			0.003	1300			0.003	4700			0.003
Selenium	µg/l	50									< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50									< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100									< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100									< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2									< 0.20	U		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2									< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000									< 10	U		0.01	2.6	J		0.01	< 10	U		0.01
Zinc, dissolved	µg/l	2000									< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																					
2-Methylphenol	µg/l	540									< 5.0	U		5	< 24	U		24	< 4.8	U		4.8
bis(2-Ethylhexyl) phthalate	µg/l	6									< 5.0	U		5	< 24	U		24	< 4.8	U		4.8
Naphthalene	µg/l	100									< 5.0	U		5	< 24	U		24	160			9.4
N-Nitrosodibutylamine	µg/l	0.003									< 10	UJ		10	< 47	UJ		47	182			19
N-Nitrosopyrrolidine	µg/l	0.03									< 10	UJ		10	< 47	UJ		47	156			19
o-Toluidine	µg/l	0.2									< 10	UJ		10	< 47	UJ		47	< 9.5	U		9.5
Phenol	µg/l	2000									< 5.0	U		5	< 24	U		24	< 4.8	U		4.8
Pyridine	µg/l	9									< 25	U		25	< 120	U		120	< 24	U		24
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	< 1.0	U		1.0	< 4.0	U	U	4.0	6.1			1	8			1	59			1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1.0	< 4.0	U	U	4.0	0.76	J		1	0.6	J		1	5.4			1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	0.45	J		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	110			6.4	54			6.4	2			1.6	4.2			1.6	27	J		1.6
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 40	U	U	40	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 40	U	U	40	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5.0	< 20	U	U	20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	2.3			1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	0.68	J		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---	< 2.0	U		2.0	< 8.0	U	U	8.0												
cis-1,2-Dichloroethene	µg/l	70	< 1.0	U		1.0	< 4.0	U	U	4.0	< 2.0	U		2	< 2.0	U		2	3.6			2
Dichloromethane (Methylene chloride)	µg/l	5	0.84	J	R	1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	1.3			1
Ethyl benzene	µg/l	700	4.0			1.0	27			4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	15			1.0	7.7			4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	120		J	5.0	39			20	< 5.0	U		5	< 5.0	U		5	1.3	J		5
Toluene	µg/l	1000	1.9			1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	2.1			1
Vinyl Chloride	µg/l	2	< 1.0	U		1.0	< 4.0	U	U	4.0	< 1.0	U		1	< 1.0	U		1	1.4			1
Xylenes (unspecified)	µg/l	10000	180			8.0	41			8.0	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Group: Northern Landfill Lobe and FDDA Sample ID Date			MW-7S 2013-03-21				MW-7S 2013-09-23				MW-7S 2014-05-07				MW-7S 2014-10-31			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.47				0.98				0.38				0.27			
Iron, Ferrous	mg/l	---	0.75				1				2				2.5			
Oxidation Reduction Potential	mV	---	-49.1				-12				-122.1				-114.1			
pH	SU	---	6.63				6.24				6.73				6.59			
Specific Conductance	µs/cm	---	490				855				591				597			
Temperature	CELSIUS	---	3.65				13.7				9.24				12.91			
Turbidity, field	NTU	---	7.94				3.8				4				3.04			
Metals																		
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1					0.42	J		1
Antimony, dissolved	µg/l	6					< 1.0	U		1					0.31	J		1
Arsenic	µg/l	10	13.9			1	30.2			1					23.4			1
Arsenic, dissolved	µg/l	10					29.8			1					24.1			1
Beryllium	µg/l	4	< 0.70	U		0.7	0.039	J		0.7					0.059	J		0.7
Beryllium, dissolved	µg/l	4					< 0.70	U		0.7					< 0.70	U		0.7
Cadmium	µg/l	5	0.28	J		0.5	0.53			0.5					< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					0.077	J		0.5					< 0.50	U		0.5
Chromium	µg/l	100	1	J		0.004	< 4.0	U		0.004					1.1	J		0.004
Chromium, dissolved	µg/l	100					< 4.0	U		0.004					1.5	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	3.8	J		0.005
Lead, dissolved	µg/l	15					< 5.0	U		0.005					3	J		0.005
Manganese	µg/l	300	500			0.003	4500			0.003					1400			0.003
Manganese, dissolved	µg/l	300					4600			0.003					1400	^		0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015					< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003					< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	U		0.2					< 0.20	U		0.2
Zinc	µg/l	2000	5.6	J		0.01	5.9	J		0.01					< 10	U		0.01
Zinc, dissolved	µg/l	2000					3.1	J		0.01					< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																	
2-Methylphenol	µg/l	540	< 5.1	U		5.1	< 3.8	U		3.8	< 4.5	U		4.5	< 5.0	U		5
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.1	*U		5.1	< 3.8	U		3.8	< 4.5	U		4.5	< 5.0	U		5
Naphthalene	µg/l	100	< 5.1	U		5.1	< 3.8	U		3.8	< 4.5	U		4.5	< 5.0	U		5
N-Nitrosodibutylamine	µg/l	0.003	< 10	U		10	< 7.6	*U		7.6	< 9.1	UJ		9.1	< 10	U		10
N-Nitrosopyrrolidine	µg/l	0.03	< 10	U		10	< 7.6	*U		7.6	< 9.1	UJ		9.1	< 10	U		10
o-Toluidine	µg/l	0.2	< 10	U		10	< 7.6	U		7.6	< 9.1	UJ		9.1	< 10	U		10
Phenol	µg/l	2000	< 5.1	U		5.1	< 3.8	U		3.8	< 4.5	U		4.5	< 5.0	U		5
Pyridine	µg/l	9	< 25	U		25	< 19	U		19	< 23	U		23	< 25	U		25
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,1-Dichloroethane	µg/l	360	2.1			1	53			1	5.4			1	9			1
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	4.8			1	< 1.0	U		1	0.81	J		1
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	0.38	J		1	< 1.0	U		1	< 1.0	U		1
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
1,4-Dioxane	µg/l	4	4			1.6	46			1.6	5.6			1.6	6.7			3.2
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	3	J		10	< 10	U		10	< 10	U		10	< 10	U		10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Benzene	µg/l	5	< 1.0	U		1	0.58	J		1	< 1.0	U		1	< 1.0	U		1
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2	2.7			2	< 2.0	U		2	< 2.0	U		2
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	1.2			1	< 1.0	U		1	< 1.0	U		1
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Tetrahydrofuran	µg/l	227	< 5.0	U		5	1.8	J		5	< 5.0	U		5	< 5.0	U		5
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1
Trichloroethene	µg/l	5	< 1.0	U		1	1.7			1	< 1.0	U		1	< 1.0	U		1
Vinyl Chloride	µg/l	2	< 1.0	U		1	0.91	J		1	< 1.0	U		1	< 1.0	U		1
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrai
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Northern Landfill Lobe and FDDA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-7S 2015-05-11				MW-7S 2015-10-27				MW-7S 2017-03-29				MW-7S 2017-08-08				MW-7S 2017-10-12			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.1				0.13				0.33				0.11				0.83			
Iron, Ferrous	mg/l	---	1.5				1				1.5				2.5				4.0			
Oxidation Reduction Potential	mV	---	-21				6.3				-40.8				-69				-22.3			
pH	SU	---	6.32				6.17				6.48				6.33				5.94			
Specific Conductance	µs/cm	---	403				489				659				676				785			
Temperature	CELSIUS	---	9.99				13.24				5.99				16.34				17.44			
Turbidity, field	NTU	---	3.98				31.6				50.2				15.7				5.7			
Metals																						
Antimony	µg/l	6	0.28	J		1	< 1.0	U		1												
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1												
Arsenic	µg/l	10	27.1			1	28.5			1	45.9			1.0	36.8			1.0	33.8			1.0
Arsenic, dissolved	µg/l	10	27			1	24.7			1	33.3			1.0	36.1			1.0	33.1			1.0
Beryllium	µg/l	4	0.045	J		0.7	< 0.70	U		0.7												
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	< 0.70	U		0.7												
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5												
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5												
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004												
Chromium, dissolved	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004												
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005												
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005												
Manganese	µg/l	300	3200			0.003	4100			0.003	3700			0.0030	3840	B		3.0	4310	B		3.0
Manganese, dissolved	µg/l	300	3300	B		0.003	3900			0.003	3800			0.0030	3760	B		3.0	4540	B		3.0
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015												
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015												
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003												
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003												
Thallium	µg/l	2	0.015	J		0.2	< 0.20	U		0.2												
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2												
Zinc	µg/l	2000	2.7	J		0.01	2.4	J		0.01												
Zinc, dissolved	µg/l	2000	5.4	J		0.01	2.7	J		0.01												
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																					
2-Methylphenol	µg/l	540	< 47	*U		47	< 5.5	U		5.5									< 5.0	U		5.0
bis(2-Ethylhexyl) phthalate	µg/l	6	< 47	UJ		47	< 5.5	U		5.5									< 5.0	U		5.0
Naphthalene	µg/l	100	< 47	UJ		47	< 5.5	U		5.5									< 5.0	U		5.0
N-Nitrosodibutylamine	µg/l	0.003	< 95	*U		95	< 11	UJ		11									< 10	U		10
N-Nitrosopyrrolidine	µg/l	0.03	< 95	*U		95	< 11	UJ		11									< 10	U		10
o-Toluidine	µg/l	0.2	< 95	*U		95	< 11	UJ		11									< 10	U		10
Phenol	µg/l	2000	< 47	*U		47	< 5.5	U		5.5									< 5.0	U		5.0
Pyridine	µg/l	9	< 240	U		240	< 27	U		27									< 25	U		25
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,1-Dichloroethane	µg/l	360	42			1	68			1	40			1.0	48			1.0	72			1.0
1,1-Dichloroethene	µg/l	7	4.1			1	7.7			1	3.4			1.0	6.1			1.0	8.7			1.0
1,2-Dichloroethane	µg/l	5	< 1.0	U		1	0.79	J		1	0.56	J		1.0	0.75	J		1.0	1.1			1.0
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
1,4-Dioxane	µg/l	4	27			3.2	30			8	52			32	49			32	54			6.4
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10
Acetone	µg/l	5600	< 10	U		10	< 10	U		10	< 10	U		10	< 10	U		10	< 10	J	U AT RL	10
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5.0	< 5.0	U		5.0	0.95	J		5.0
Benzene	µg/l	5	0.52	J		1	0.99	J		1	0.69	J		1.0	1.1			1.0	1.5			1.0
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
Chloroform	µg/l	80	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
cis/trans 1,2-Dichloroethene	µg/l	---									2.5			2.0	4.2			2.0	5.6			2.0
cis-1,2-Dichloroethene	µg/l	70	2.6			2	4.5			2	2.5			1.0	4.2			1.0	5.6			1.0
Dichloromethane (Methylene chloride)	µg/l	5	< 1.0	U		1	0.57	J		1	1.1	R	R	1.0	1.0			1.0	1.6			1.0
Ethyl benzene	µg/l	700	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	0.88	J		1.0	< 1.0	U		1.0
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
n-Propylbenzene	µg/l	52	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
Styrene	µg/l	100	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
Tetrahydrofuran	µg/l	227	17			5	< 5.0	U		5	1.6	J	J	5.0	1.6	J		5.0	1.9	J		5.0
Toluene	µg/l	1000	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1.0	< 1.0	U		1.0	< 1.0	U		1.0
Trichloroethene	µg/l	5	1.7			1	3			1	1.5			1.0	2.5			1.0	3.5			1.0
Vinyl Chloride	µg/l	2	< 1.0	U		1	1.4			1	< 1.0	U		1.0	< 1.0	U		1.0	1.3			1.0
Xylenes (unspecified)	µg/l	10000	< 2.0	U		2	< 2.0	U		2	< 2.0	U		2.0	< 2.0	U		2.0	< 2.0	U		2.0

Parameter	MW-8M 2011-09-14				MW-8M 2012-03-28				MW-8M 2012-09-24				MW-8M 2013-03-25				MW-8M 2013-09-25				MW-8M 2014-05-07				MW-8M 2014-10-29				MW-8M 2015-05-11			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																																
Dissolved Oxygen	-0.13				1.94				NA				0.4				1.06				0.52				0.2				0.22			
Iron, Ferrous	8.2				1.49				NA				1.26				1.7				2.25				2				1			
Oxidation Reduction Potential	-136				-113.4				NA				-171.1				-96				-146.4				-155.6				-81.6			
pH	6.7				6.74				NA				6.75				7.09				6.69				6.91				6.68			
Specific Conductance	4238				457				NA				2490				2208				2918				3607				2317			
Temperature	12.54				9.32				NA				8.2				14.9				10.7				11.21				11.28			
Turbidity, field	4.82				2.64				NA				1.38				16				1.67				4.52				8.52			
Metals																																
Antimony	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1	0.46	J		1					0.4	J		1	0.47	J		1
Antimony, dissolved	< 1.0	U		1	< 1.0	U		1	0.52	J		1					0.44	J		1					0.44	J		1	0.43	J		1
Arsenic	1590			10	1760			5	1200			5	1360			5	978			1					1120			5	947	J		5
Arsenic, dissolved	1570			10	1600			5	1190			5					575			1					1100	B		5	1050			5
Beryllium	< 0.70	U		0.7	< 0.70	U		0.7	0.039	J		0.7	0.03	J		0.7	0.036	J		0.7					< 3.5	U		3.5	0.045	J		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7					0.05	J		0.7					< 3.5	U		3.5	0.032	J		0.7
Cadmium	< 0.50	UJ		0.5	< 0.50	UJ		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	< 0.50	UJ		0.5	< 0.50	UJ		0.5	< 0.50	U		0.5					< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5
Chromium	4.3			0.004	4.8			0.004	3.4	J		0.004	4.3			0.004	1.1	J		0.004					2.5	J		0.004	4			0.004
Chromium, dissolved	3.6	J		0.004	2.7	J		0.004	3.3	J		0.004					1.7	J		0.004					2.4	J		0.004	3.6	J		0.004
Lead	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	UJ		0.005	3.3	J		0.005	< 5.0	U		0.005
Lead, dissolved	3.6	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005					3.5	J		0.005	< 5.0	U		0.005
Manganese	240			0.003	330			0.003	1000			0.003	530	B		0.003	890			0.003					960			0.003	750			0.003
Manganese, dissolved	260			0.003	330			0.003	960			0.003					630			0.003					890			0.003	760	B		0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015					< 15	U		0.015	< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	UJ		0.2					< 0.20	U		0.2				
Thallium, dissolved	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					0.029	J		0.2					< 0.20	U		0.2				
Zinc	< 10	UJ		0.01	< 10	U		0.01	3.2	J		0.01	< 10	U		0.01	6.7	J		0.01					< 10	U		0.01	< 10	UJ		0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					< 10	U		0.01					3.1	J		0.01	3.7	J		0.01
Semi Volatile Organic Compounds																																
2-Methylphenol	20			4.7	12			5	14			4.8	3.5	J		4.8	18			5	< 23	U		23	< 5.2	U		5.2	3.3	J		30
bis(2-Ethylhexyl) phthalate	< 4.7	U		4.7	< 5.0	U		5	< 4.8	U		4.8	< 4.8	U		4.8	< 5.0	UJ		5	< 23	U		23	< 5.2	U		5.2	< 30	UJ		30
Naphthalene	5.6			4.7	1.3	J		5	1.8	J		4.8	0.95	J		4.8	< 5.0	UJ		5	< 23	U		23	0.83	J		5.2	< 30	UJ		30
N-Nitrosodibutylamine	< 9.4	UJ		9.4	< 9.9	U		9.9	< 9.6	U		9.6	< 9.5	U		9.5	< 10	UJ		10	< 47	UJ		47	< 10	U		10	5.4	J		60
N-Nitrosopyrrolidine	< 9.4	UJ		9.4	< 9.9	U		9.9	< 9.6	U		9.6	< 9.5	U		9.5	< 10	UJ		10	< 47	UJ		47	< 10	U		10	< 60	*U		60
o-Toluidine	< 9.4	UJ		9.4	47			9.9	8.9	J		9.6	57			9.5	< 10	UJ		10	< 47	UJ		47	< 10	U		10	23	J		60
Phenol	< 4.7	U		4.7	< 5.0	U		5	< 4.8	U		4.8	< 4.8	U		4.8	< 5.0	U		5	< 23	U		23	< 5.2	U		5.2	< 30	*U		30
Pyridine	< 24	U		24	< 25	U		25	< 24	U		24	< 24	U		24	< 25	UJ		25	< 120	U		120	< 26	U		26	< 150	U		150
Volatile Organic Compounds																																
1,1,1-Trichloroethane	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,1,2-Trichloroethane	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,1-Dichloroethane	31			5	18	J		20	18			10	12	J		20	69			20	4.2	J		5	< 5.0	U		5	2.7	J		5
1,1-Dichloroethene	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,2-Dichloroethane	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,2-Dichloropropane	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,4-Dichlorobenzene	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
1,4-Dioxane	220	J		8	130			8	200			16	270			32	350			32	300	J		32	270			32	250			64
2-Butanone (MEK)	< 50	U		50	< 200	U		200	< 100	U		100	< 200	U		200	< 200	U		200	< 50	U		50	< 50	U		50	< 50	U		50
Acetone	30	J		50	< 200	U		200	< 100	U		100	< 200	U		200	< 200	U		200	< 50	U		50	< 50	UJ		50	< 50	U		50
Acrylonitrile	< 25	U		25	< 100	U		100	< 50	U		50	< 100	U		100	< 100	U		100	< 25	U		25	< 25	U		25	< 25	U		25
Benzene	8.7			5	< 20	U		20	4.9	J		10	< 20	U		20	< 20	U		20	4	J		5	4	J		5	4	J		5
Carbon tetrachloride	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Chloroform	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
cis/trans 1,2-Dichloroethene																																
cis-1,2-Dichloroethene	< 10	U		10	< 40	U		40	< 20	U		20	< 40	U		40	< 40	U		40	< 10	U		10	< 10	U		10	< 10	U		10
Dichloromethane (Methylene chloride)	21			5	18	J		20	9.2	J		10	< 20	U		20	23			20	2.4	J		5	< 5.0	U		5	< 5.0	U		5
Ethyl benzene	550			50	320			20	360			10	150			20	740			20	55			5	100			5	140			5
Ethyl methacrylate	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
n-Propylbenzene	25			5	17	J		20	12			10	< 20	U		20	19	J		20	5.7			5	6.7			5	9.4			5
Styrene	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Tetrachloroethene	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Tetrahydrofuran	190			25	190			100	130			50	100			100	220			100	91			25	96			25	100			25
Toluene	2400			50	1400			20	1400			20	280			20	3600			50	87			5	37			5	250			5
Trichloroethene	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Vinyl Chloride	< 5.0	U		5	< 20	U		20	< 10	U		10	< 20	U		20	< 20	U		20	< 5.0	U		5	< 5.0	U		5	< 5.0	U		5
Xylenes (unspecified)	1900			100	720			40	740			20	260			40	1600			40	120			10	120			10	220			10

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group Northern Landfill Lobe and FDDA

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-8M 2015-10-27				MW-9 2011-09-21				MW-9 2012-03-29				MW-9 2012-09-27			
			Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.08				1.16				0.47				NA			
Iron, Ferrous	mg/l	---	2.5				7.1				3.3				NA			
Oxidation Reduction Potential	mV	---	-65.4				-120.5				-71.2				NA			
pH	SU	---	6.35				6.29				6.67				NA			
Specific Conductance	µs/cm	---	1858				1862				207				NA			
Temperature	CELSIUS	---	11.1				13.69				8.07				NA			
Turbidity, field	NTU	---	3.22				7.9				16.4				NA			
Metals																		
Antimony	µg/l	6	0.39	J		1	1.4			1	1.3			1	1.5			1
Antimony, dissolved	µg/l	6	0.37	J		1	1.4			1	1.3			1	1.4			1
Arsenic	µg/l	10	963			5	308			1	292			1	369			1
Arsenic, dissolved	µg/l	10	946			5	300			1	295			1	322			1
Beryllium	µg/l	4	< 0.70	U		0.7	0.042	J		0.7	0.035	J		0.7	0.067	J		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	0.039	J		0.7	0.03	J		0.7	0.057	J		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	0.042	J		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100	3.4	J		0.004	2.1	J		0.004	< 4.0	U		0.004	2.1	J		0.004
Chromium, dissolved	µg/l	100	3.5	J		0.004	1.2	J		0.004	< 4.0	U		0.004	2	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	3.1	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	5.8	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300	760			0.003	11400			0.003	9700			0.003	8900			0.003
Manganese, dissolved	µg/l	300	820			0.003	11000			0.003	9800			0.003	8900			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	0.026	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000	< 10	U		0.01	11			0.01	4.4	J		0.01	8	J		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540	1.2	J		5.7	430			94	180			48	760			95
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.7	U		5.7	< 4.7	U		4.7	< 48	U		48	< 4.8	U		4.8
Naphthalene	µg/l	100	< 5.7	U		5.7	< 4.7	U		4.7	< 48	U		48	5.5			4.8
N-Nitrosodibutylamine	µg/l	0.003	4.4	J		11	< 9.4	UJ		9.4	< 96	U		96	< 9.5	U		9.5
N-Nitrosopyrrolidine	µg/l	0.03	< 11	UJ		11	< 9.4	UJ		9.4	< 96	U		96	< 9.5	U		9.5
o-Toluidine	µg/l	0.2	6.8	J		11	< 9.4	UJ		9.4	< 96	U		96	< 9.5	U		9.5
Phenol	µg/l	2000	< 5.7	U		5.7	830			94	320			48	1800			95
Pyridine	µg/l	9	< 29	U		29	< 24	U		24	< 240	U		240	< 24	U		24
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	12700			500
1,1,2-Trichloroethane	µg/l	5	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	10500			500
1,1-Dichloroethane	µg/l	360	< 5.0	UJ		5	71			1	6.2			1	11900			500
1,1-Dichloroethene	µg/l	7	< 5.0	UJ		5	< 1.0	U		1	1.3			1	9870			500
1,2-Dichloroethane	µg/l	5	< 5.0	UJ		5	< 1.0	U		1	4.3			1	11400			500
1,2-Dichloropropane	µg/l	5	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	12000			500
1,4-Dichlorobenzene	µg/l	75	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	11200			500
1,4-Dioxane	µg/l	4	180			6.4	< 1.6	U		1.6	640			160				
2-Butanone (MEK)	µg/l	4000	< 50	UJ		50	43000			5000	7700	J		5000	59600			5000
Acetone	µg/l	5600	< 50	UJ		50	50000			5000	8800	J		5000	65400			5000
Acrylonitrile	µg/l	0.05	< 25	UJ		25	83			5	33			5	47200			2500
Benzene	µg/l	5	3.7	J		5	210	J		500	160	J		1	12100			500
Carbon tetrachloride	µg/l	5	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	12000			500
Chloroform	µg/l	80	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	12000			500
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	< 10	UJ		10	< 2.0	U		2	7.4			2	< 1000	U		1000
Dichloromethane (Methylene chloride)	µg/l	5	2.4	J		5	340	J		500	23			1	11000			500
Ethyl benzene	µg/l	700	76	J		5	5800			500	4000	J		500	5500			500
Ethyl methacrylate	µg/l	260	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	10400			500
n-Propylbenzene	µg/l	52	6.1	J		5	160	J		1	72			1	11900			500
Styrene	µg/l	100	< 5.0	UJ		5	< 1.0	U		1	< 1.0	U		1	13500			500
Tetrachloroethene	µg/l	5	< 5.0	UJ		5	6			1	0.52	J		1	11900			500
Tetrahydrofuran	µg/l	227	87	J		25	8300			2500	10000	J		2500	54900			2500
Toluene	µg/l	1000	44	J		5	49000			500	40000	J		500				
Trichloroethene	µg/l	5	< 5.0	UJ		5	5.5			1	1			1	11300			500
Vinyl Chloride	µg/l	2	< 5.0	UJ		5	17			1	3.5			1	14000			500
Xylenes (unspecified)	µg/l	10000	110	J		10	23000			1000	20000	J		1000	59600			1000

Parameter	MW-9 2013-03-20				MW-9 2013-09-24				MW-9 2014-05-07				MW-9 2014-10-31			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.19				0.41				0.19				0.24			
Iron, Ferrous	1.87				4.05				7				3.5			
Oxidation Reduction Potential	-93				-63				-165.2				-145.9			
pH	6.51				5.97				6.45				6.46			
Specific Conductance	1517				1676				1486				1534			
Temperature	6.19				13.7				11.96				12.5			
Turbidity, field	5.09				8.5				10				3.41			
Metals																
Antimony	1.4			1	1.4			1					0.65	J		1
Antimony, dissolved					1.3			1					0.63	J		1
Arsenic	230			1	347			1					186			1
Arsenic, dissolved					313			1					183			1
Beryllium	0.057	J		0.7	0.06	J		0.7					0.038	J		0.7
Beryllium, dissolved					0.036	J		0.7					< 0.70	U		0.7
Cadmium	0.076	J		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Cadmium, dissolved					0.076	J		0.5					< 0.50	U		0.5
Chromium	< 4.0	U		0.004	< 4.0	U		0.004					3.9	J		0.004
Chromium, dissolved					< 4.0	U		0.004					< 4.0	U		0.004
Lead	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	UJ		0.005	4.5	J		0.005
Lead, dissolved					< 5.0	U		0.005					3.2	J		0.005
Manganese	8900	B		0.003	8300			0.003					7200			0.003
Manganese, dissolved					8500			0.003					7600	^		0.003
Selenium	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Selenium, dissolved					< 15	U		0.015					< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Silver, dissolved					< 3.0	U		0.003					< 3.0	U		0.003
Thallium	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Thallium, dissolved					< 0.20	U		0.2					< 0.20	U		0.2
Zinc	2.7	J		0.01	5.5	J		0.01					< 10	UJ		0.01
Zinc, dissolved					5.5	J		0.01					12	J		0.01
Semi Volatile Organic Compounds																
2-Methylphenol	360			95	290			76	570			460	< 1100	U		1100
bis(2-Ethylhexyl) phthalate	< 95	*U		95	< 76	U		76	< 460	U		460	< 1100	U		1100
Naphthalene	< 95	U		95	< 76	U		76	< 460	U		460	< 1100	U		1100
N-Nitrosodibutylamine	< 190	U		190	< 150	*U		150	< 930	UJ		930	< 2100	U		2100
N-Nitrosopyrrolidine	< 190	U		190	< 150	*U		150	< 930	UJ		930	< 2100	U		2100
o-Toluidine	< 190	U		190	< 150	U		150	< 930	UJ		930	< 2100	U		2100
Phenol	< 95	U		95	610			76	2000			460	300	J		1100
Pyridine	< 470	U		470	< 380	U		380	< 2300	U		2300	< 5300	U		5300
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,1,2-Trichloroethane	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,1-Dichloroethane	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,1-Dichloroethene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,2-Dichloroethane	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,2-Dichloropropane	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,4-Dichlorobenzene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
1,4-Dioxane					1800			800	590	J		32	51	J		1.6
2-Butanone (MEK)	13000			5000	19000			5000	18000			10000	< 5000	U		5000
Acetone	13000			5000	30000			5000	23000			10000	< 5000	U		5000
Acrylonitrile	< 2500	U		2500	< 2500	U		2500	< 5000	U		5000	< 2500	U		2500
Benzene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Carbon tetrachloride	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Chloroform	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	< 1000	U		1000	< 1000	U		1000	< 2000	U		2000	< 1000	U		1000
Dichloromethane (Methylene chloride)	< 500	U		500	< 500	U		500	< 1000	U		1000	300	J		500
Ethyl benzene	4200			500	5800			500	5800			1000	5100			500
Ethyl methacrylate	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
n-Propylbenzene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Styrene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Tetrachloroethene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Tetrahydrofuran	8200			2500	4900			2500	6400			5000	9900			2500
Toluene	46000			500	50000			1000	54000			1000	42000			500
Trichloroethene	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Vinyl Chloride	< 500	U		500	< 500	U		500	< 1000	U		1000	< 500	U		500
Xylenes (unspecified)	23000			1000	26000			1000	27000			2000	25000			1000

Parameter	MW-9 2015-05-08				MW-9 2015-10-26				MW-9 2017-08-07				MW-9 2017-10-11			
	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.07				0.7				0.1				1.58			
Iron, Ferrous	2				2				2				7.0			
Oxidation Reduction Potential	-61.9				-82.2				-107.8				-102.6			
pH	6.29				6.45				6.47				6.5			
Specific Conductance	1020				1272				1046				1339			
Temperature	9.29				12.1				13.06				13.42			
Turbidity, field	4.02				6.8				26.1				5.75			
Metals																
Antimony	0.75	J		1	0.93	J		1								
Antimony, dissolved	0.77	J		1	0.89	J		1								
Arsenic	217			1	327			1	325			1.0	253			1.0
Arsenic, dissolved	228			1	301			1	264			1.0	310			1.0
Beryllium	0.043	J		0.7	< 0.70	^U		0.7								
Beryllium, dissolved	0.047	J		0.7	< 0.70	U		0.7								
Cadmium	0.15	J		0.5	0.048	J		0.5								
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	UJ		0.5								
Chromium	< 4.0	UJ		0.004	< 4.0	U		0.004								
Chromium, dissolved	7.3	J		0.004	< 4.0	U		0.004								
Lead	< 5.0	U		0.005	< 5.0	U		0.005								
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005								
Manganese	7700	B		0.003	5800	B		0.003	7200	B		3.0	5680	B		3.0
Manganese, dissolved	8000			0.003	5700			0.003	6360	B		3.0	7310	B		3.0
Selenium	< 15	U		0.015	< 15	U		0.015								
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015								
Silver	< 3.0	U		0.003	< 3.0	U		0.003								
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003								
Thallium	< 0.20	U		0.2	< 0.20	U		0.2								
Thallium, dissolved	< 0.20	U		0.2	< 0.20	^U		0.2								
Zinc	< 10	U		0.01	3.9	J		0.01								
Zinc, dissolved	4.3	J		0.01	2.2	J		0.01								
Semi Volatile Organic Compounds																
2-Methylphenol	340			55	110			49					170			25
bis(2-Ethylhexyl) phthalate	< 55	U		55	< 49	U		49					< 25	U		25
Naphthalene	< 55	U		55	< 49	U		49					< 25	U		25
N-Nitrosodibutylamine	< 110	U		110	< 99	UJ		99					< 50	U		50
N-Nitrosopyrrolidine	< 110	U		110	< 99	UJ		99					< 50	U		50
o-Toluidine	< 110	U		110	< 99	UJ		99					< 50	U		50
Phenol	480			55	81			49					63			25
Pyridine	< 270	U		270	< 250	U		250					< 130	U		130
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
1,1,2-Trichloroethane	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
1,1-Dichloroethane	< 500	U		500	< 500	U		500	1.9			1.0	< 200	U		200
1,1-Dichloroethene	< 500	U		500	< 500	U		500	1.7			1.0	< 200	U		200
1,2-Dichloroethane	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
1,2-Dichloropropane	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
1,4-Dichlorobenzene	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
1,4-Dioxane	510			64	440			16	870			32	600			32
2-Butanone (MEK)	19000			5000	2300	J		5000	180			10	8700			2000
Acetone	22000			5000	3700	J		5000	240			10	12000			2000
Acrylonitrile	< 2500	U		2500	< 2500	U		2500	1.1	J		5.0	< 1000	U		1000
Benzene	< 500	U		500	< 500	U		500	140	J		200	170	J		200
Carbon tetrachloride	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
Chloroform	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
cis/trans 1,2-Dichloroethene									2.1			2.0	< 400	U		400
cis-1,2-Dichloroethene	< 1000	U		1000	< 1000	U		1000	2.1			1.0	< 200	U		200
Dichloromethane (Methylene chloride)	< 500	U		500	< 500	U		500	1.2			1.0	< 200	U		200
Ethyl benzene	4000			500	2800			500	3100			200	3800			200
Ethyl methacrylate	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
n-Propylbenzene	< 500	U		500	< 500	U		500	< 200	U		200	< 200	U		200
Styrene	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
Tetrachloroethene	< 500	*U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
Tetrahydrofuran	6200			2500	5600			2500	10000			1000	9100			1000
Toluene	49000			500	26000			500	12000			200	20000			200
Trichloroethene	< 500	U		500	< 500	U		500	< 1.0	U		1.0	< 200	U		200
Vinyl Chloride	< 500	U		500	< 500	U		500	4.0			1.0	< 200	U		200
Xylenes (unspecified)	23000			1000	16000			1000	17000			400	18000			400

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group			Southern Landfill Lobe																				
Sample ID / Date			GP-16 2011-09-19				GP-16 2012-03-27				GP-16 2012-09-21				GP-16 2013-03-26				GP-16 2013-09-24			
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.14				0.83				NA				0.35				1.02			
Iron, Ferrous	mg/l	---	< 10	U		10	3.19				NA				1.47				3.35			
Oxidation Reduction Potential	mV	---	-80.9				-263.8				NA				-131.8				-67			
pH	SU	---	5.94				6.24				NA				6.07				6.27			
Specific Conductance	µs/cm	---	2322				162				NA				1553				1584			
Temperature	CELSIUS	---	12.31				8.76				NA				7.63				14			
Turbidity, field	NTU	---	1022				133				NA				123				123			
Metals																						
Antimony	µg/l	6	1.2			1	< 1.0	U		1	0.83	J		1	1.8			1	0.68	J		1
Antimony, dissolved	µg/l	6	1.1			1	< 1.0	U		1	< 1.0	U		1					0.57	J		1
Arsenic	µg/l	10	455	J		1	431	J		1	570			2	606			1	635			2
Arsenic, dissolved	µg/l	10	858	J		1	643	J		1	575			2					623			2
Beryllium	µg/l	4	0.44	J		0.7	0.38	J		0.7	0.53	J		0.7	0.41	J		0.7	0.41	J		0.7
Beryllium, dissolved	µg/l	4	0.036	J		0.7	0.039	J		0.7	0.11	J		0.7					0.056	J		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Chromium	µg/l	100	26			0.004	8.3			0.004	13			0.004	< 4.0	U		0.004	< 4.0	U		0.004
Chromium, dissolved	µg/l	100	< 4.0	UJ		0.004	< 4.0	U		0.004	< 4.0	U		0.004					< 8.0	U		0.008
Lead	µg/l	15	14			0.005	15			0.005	3.2	J		0.005	8.2			0.005	9.6			0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	8.2			0.005	< 5.0	U		0.005					9.1			0.005
Manganese	µg/l	300	2600			0.003	1900			0.003	2200			0.003	1900			0.003	2100			0.003
Manganese, dissolved	µg/l	300	2300			0.003	2000			0.003	2400			0.003					2100			0.003
Selenium	µg/l	50	< 15	UJ		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	UJ		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Silver	µg/l	100	< 3.0	UJ		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	UJ		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Thallium	µg/l	2	0.08	J		0.2	< 0.20	U		0.2	0.086	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Zinc	µg/l	2000	47			0.01	17			0.01	23			0.01	10			0.01	13			0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					8.1	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																					
2-Methylphenol	µg/l	540	20	J		240	< 250	U		250	12			4.7	24	J		98	< 390	U		390
bis(2-Ethylhexyl) phthalate	µg/l	6	< 240	U		240	< 250	U		250	< 4.7	U		4.7	< 98	U		98	< 390	U		390
Naphthalene	µg/l	100	< 240	U		240	< 250	U		250	< 4.7	U		4.7	< 98	U		98	< 390	U		390
N-Nitrosodibutylamine	µg/l	0.003	< 470	UJ		470	< 500	U		500	< 9.5	U		9.5	< 200	U		200	< 780	*U		780
N-Nitrosopyrrolidine	µg/l	0.03	< 470	UJ		470	< 500	U		500	< 9.5	U		9.5	< 200	U		200	< 780	*U		780
o-Toluidine	µg/l	0.2	< 470	UJ		470	< 500	U		500	< 9.5	U		9.5	< 200	U		200	< 780	U		780
Phenol	µg/l	2000	160	J		240	65	J		250	99			4.7	< 98	U		98	< 390	U		390
Pyridine	µg/l	9	< 1200	U		1200	< 1200	U		1200	< 24	U		24	< 490	U		490	< 2000	U		2000
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
1,1,2-Trichloroethane	µg/l	5	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
1,1-Dichloroethane	µg/l	360	45			4	38	J		40	< 80	U		80	34	J		80	22	J		40
1,1-Dichloroethene	µg/l	7	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
1,2-Dichloroethane	µg/l	5	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
1,2-Dichloropropane	µg/l	5	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
1,4-Dichlorobenzene	µg/l	75	41			4	35	J		40	< 80	U		80	< 80	U		80	< 40	U		40
1,4-Dioxane	µg/l	4	< 6.4	U		6.4	< 6.4	U		6.4					< 8.0	U		8	< 1.6	U		1.6
2-Butanone (MEK)	µg/l	4000	600			40	320	J		400	< 800	U		800	200	J		800	260	J		400
Acetone	µg/l	5600	940			40	500			400	440	J		800	370	J		800	550			400
Acrylonitrile	µg/l	0.05	< 20	U		20	< 200	U		200	< 400	U		400	< 400	U		400	< 200	U		200
Benzene	µg/l	5	19			4	16	J		40	< 80	U		80	< 80	U		80	< 40	U		40
Carbon tetrachloride	µg/l	5	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Chloroform	µg/l	80	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	270			8	190			80	160			160	200			160	160			80
Dichloromethane (Methylene chloride)	µg/l	5	9.6			4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Ethyl benzene	µg/l	700	250			4	230			40	200			80	230			80	170			40
Ethyl methacrylate	µg/l	260	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
n-Propylbenzene	µg/l	52	4.2			4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Styrene	µg/l	100	< 4.0	U		4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Tetrachloroethene	µg/l	5	9.1			4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Tetrahydrofuran	µg/l	227	40			20	< 200	U		200	< 400	U		400	< 400	U		400	< 200	U		200
Toluene	µg/l	1000	4400			80	3600			40	3300			80	3900			80	3200			40
Trichloroethene	µg/l	5	46			4	34	J		40	< 80	U		80	< 80	U		80	< 40	U		40
Vinyl Chloride	µg/l	2	24			4	< 40	U		40	< 80	U		80	< 80	U		80	< 40	U		40
Xylenes (unspecified)	µg/l	10000	900			8	850			80	740			160	870			160	670			80

Sample ID / Date	GP-16 2014-05-06				GP-16 2014-10-31				GP-16 2015-05-07				GP-16 2015-10-26			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.18				0.2				0.86				0.37			
Iron, Ferrous	4.5				4				3.5				2.5			
Oxidation Reduction Potential	-132.1				-92				-25.8				-72.7			
pH	6.09				5.71				5.96				5.68			
Specific Conductance	1361				1414				1674				1287			
Temperature	9.95				11.88				10.33				12.61			
Turbidity, field	720				321				155				249			
Metals																
Antimony					0.85	J		1	1.1			1	1.2			1
Antimony, dissolved					0.8	J		1	0.96	J		1	0.96	J		1
Arsenic					577			1	629			1	694			2
Arsenic, dissolved					610			1	643			1	645			2
Beryllium					0.36	J		0.7	3.2			0.7	0.78			0.7
Beryllium, dissolved					0.062	J		0.7	0.043	J		0.7	< 0.70	U		0.7
Cadmium					< 0.50	U		0.5	0.98	B		0.5	0.24	J		0.5
Cadmium, dissolved					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium					8.3			0.004	120			0.004	19			0.004
Chromium, dissolved					< 4.0	U		0.004	< 4.0	U		0.004	< 4.0	U		0.004
Lead	5.9			0.005	11			0.005	35			0.005	< 5.0	U		0.005
Lead, dissolved					3.9	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	2300			0.003	2000			0.003	2500	B		0.003	1500	B		0.003
Manganese, dissolved					1900	^		0.003	1600	B		0.003	1400			0.003
Selenium					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver					< 3.0	U		0.003	< 6.0	U		0.006	< 3.0	U		0.003
Silver, dissolved					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium					< 0.20	U		0.2	0.36			0.2	0.11	J		0.2
Thallium, dissolved					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc					18	B		0.01	150	B		0.01	26			0.01
Zinc, dissolved					< 10	U		0.01	17	B		0.01	6.3	J		0.01
Semi Volatile Organic Compounds																
2-Methylphenol	< 460	U		460	54	J		500	< 4.8	U		4.8	< 480	U		480
bis(2-Ethylhexyl) phthalate	< 460	U		460	< 500	U		500	< 4.8	U		4.8	< 480	U		480
Naphthalene	< 460	U		460	110	J		500	8.9			4.8	< 480	U		480
N-Nitrosodibutylamine	< 930	U		930	60	J		990	< 9.6	U		9.6	< 960	UJ		960
N-Nitrosopyrrolidine	< 930	UJ		930	< 990	U		990	< 9.6	U		9.6	< 960	UJ		960
o-Toluidine	< 930	UJ		930	< 990	U		990	< 9.6	U		9.6	< 960	UJ		960
Phenol	< 460	U		460	890			500	46			4.8	100	J		480
Pyridine	< 2300	U		2300	< 2500	U		2500	< 24	U		24	< 2400	U		2400
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,1,2-Trichloroethane	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,1-Dichloroethane	33	J		80	< 80	U		80	< 80	U		80	< 80	U		80
1,1-Dichloroethene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,2-Dichloroethane	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,2-Dichloropropane	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,4-Dichlorobenzene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
1,4-Dioxane	< 3.2	U		3.2	< 16	U		16	< 32	U		32	< 8.0	U		8
2-Butanone (MEK)	260	J		800	340	J		800	390	J		800	380	J		800
Acetone	590	J		800	< 800	U		800	690	J		800	650	J		800
Acrylonitrile	< 400	U		400	< 400	U		400	< 400	U		400	< 400	U		400
Benzene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Carbon tetrachloride	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Chloroform	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	190			160	170			160	180			160	110	J		160
Dichloromethane (Methylene chloride)	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Ethyl benzene	260			40	250			80	280			80	170			80
Ethyl methacrylate	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
n-Propylbenzene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Styrene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Tetrachloroethene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Tetrahydrofuran	< 400	U		400	< 400	U		400	< 400	U		400	< 400	U		400
Toluene	4100			80	3700			80	4000			80	2400			80
Trichloroethene	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Vinyl Chloride	< 80	U		80	< 80	U		80	< 80	U		80	< 80	U		80
Xylenes (unspecified)	950			160	920			160	1000			160	670			160

Sample ID / Date	GP-16 2017-03-29				GP-16 2017-06-28				GP-16 2017-08-07				GP-16 2017-10-12			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	1.03				6.95				0.18				0.48			
Iron, Ferrous					6				6.5				7.0			
Oxidation Reduction Potential	-71.6				-51.8				-80.3				-67.4			
pH	6.26				5.07				6.13				5.99			
Specific Conductance	897				987				949				1077			
Temperature	7.52				12.57				13.87				12.64			
Turbidity, field	72.1				15.7				37.1				36.7			
Metals																
Antimony																
Antimony, dissolved																
Arsenic	603			1.0	605			1.0	543			1.0	779			10.0
Arsenic, dissolved	637			1.0	576			1.0	600	F1		1.0	566			1.0
Beryllium																
Beryllium, dissolved																
Cadmium																
Cadmium, dissolved																
Chromium																
Chromium, dissolved																
Lead																
Lead, dissolved																
Manganese	1100			0.0030	985			3.0	1080	B		3.0	1030			3.0
Manganese, dissolved	1100			0.0030	1020			3.0	896	B		3.0	690	B		3.0
Selenium																
Selenium, dissolved																
Silver																
Silver, dissolved																
Thallium																
Thallium, dissolved																
Zinc																
Zinc, dissolved																
Semi Volatile Organic Compounds																
2-Methylphenol													26			25
bis(2-Ethylhexyl) phthalate													< 25	U		25
Naphthalene													5.6	J		25
N-Nitrosodibutylamine													< 50	U		50
N-Nitrosopyrrolidine													< 50	U		50
o-Toluidine													< 50	U		50
Phenol													270			25
Pyridine													< 130	U		130
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
1,1,2-Trichloroethane	< 50	U		50	< 50	U	U	50	< 20	U		20	< 20	U		20
1,1-Dichloroethane	< 50	U		50	< 50	U	U	50	14	F2 J		20	12	J		20
1,1-Dichloroethene	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
1,2-Dichloroethane	< 50	U		50	< 50	U	U	50	< 20	U		20	< 20	U		20
1,2-Dichloropropane	< 50	U		50	< 50	U	U	50	< 20	U		20	< 20	U		20
1,4-Dichlorobenzene	48	J		50	< 50	U	U	50	50			20	45			20
1,4-Dioxane	< 16	U F1 F2	J	16	< 1.6	U	U	1.6	23	F1	J	1.6	< 16	U		16
2-Butanone (MEK)	320	J		500	240	J	J	500	270			200	270			200
Acetone	500			500	430	J	J	500	470			200	440			200
Acrylonitrile	< 250	U		250	< 250	U	U	250	< 100	U		100	< 100	U		100
Benzene	< 50	U		50	< 50	U	U	50	15	F2 J		20	14	J		20
Carbon tetrachloride	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
Chloroform	< 50	U	UJ	50	< 50	U	U	50	< 20	U		20	< 20	U		20
cis/trans 1,2-Dichloroethene	120			100	75	J	J	100	94	F2		40	80			40
cis-1,2-Dichloroethene	120			50	75			50	94			20	80			20
Dichloromethane (Methylene chloride)	< 50	U		50	22	J	J	50	< 20	U		20	< 20	U		20
Ethyl benzene	220			50	170			50	230	F2		20	190			20
Ethyl methacrylate	< 50	U		50	< 50	U	U	50	< 20	U		20	< 20	U		20
n-Propylbenzene	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
Styrene	< 50	U		50	< 50	U	U	50	< 20	U		20	< 20	U		20
Tetrachloroethene	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
Tetrahydrofuran	110	J		250	< 250	U	U	250	92	J		100	140			100
Toluene	3100			50	2100			50	2600	F1	J	50	2200			50
Trichloroethene	< 50	U		50	< 50	U	U	50	< 20	U F2		20	< 20	U		20
Vinyl Chloride	< 50	U	UJ	50	< 50	U	U	50	< 20	U		20	< 20	U		20
Xylenes (unspecified)	830			100	580			100	880			40	750			40

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligram
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

		Group	Southern Landfill Lobe																			
		Sample ID / Date	GP-18 2011-09-20				GP-18 2012-03-27				GP-18 2012-09-21				GP-18 2013-03-26				GP-18 2013-09-24			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																						
Dissolved Oxygen	mg/l	---	0.48				0.36				NA				0.2				0.58			
Iron, Ferrous	mg/l	---	5.6				1.71				NA				0.86				1.17			
Oxidation Reduction Potential	mV	---	-121.5				-66.7				NA				-147.8				-89			
pH	SU	---	6.52				6.85				NA				6.75				6.72			
Specific Conductance	µs/cm	---	2480				96				NA				528				1522			
Temperature	CELSIUS	---	10.07				9.37				NA				8.61				12.2			
Turbidity, field	NTU	---	3.43				0.94				NA				1.35				4.8			
Metals																						
Antimony	µg/l	6	< 1.0	U		1	< 1.0	U		1	0.33	J		1	< 1.0	U		1	0.32	J		1
Antimony, dissolved	µg/l	6	< 1.0	U		1	< 1.0	U		1	< 1.0	U		1					0.32	J		1
Arsenic	µg/l	10	834			10	649			1	780			5	793			1	656			1
Arsenic, dissolved	µg/l	10	788			1	638			1	785			5					665			1
Beryllium	µg/l	4	0.036	J		0.7	0.043	J		0.7	0.043	J		0.7	< 0.70	U		0.7	0.062	J		0.7
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	0.034	J		0.7	0.037	J		0.7					0.043	J		0.7
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Chromium	µg/l	100	2.9	J		0.004	1	J		0.004	1	J		0.004	1.2	J		0.004	1.9	J		0.004
Chromium, dissolved	µg/l	100	2.7	J		0.004	1.2	J		0.004	2.1	J		0.004					2	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	3.1	J		0.005	< 5.0	U		0.005					< 5.0	U		0.005
Manganese	µg/l	300	720			0.003	630			0.003	600			0.003	490			0.003	820			0.003
Manganese, dissolved	µg/l	300	750			0.003	630			0.003	630			0.003					780			0.003
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Thallium	µg/l	2	0.098	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2	0.1	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Zinc	µg/l	2000	< 10	U		0.01	< 10	U		0.01	1.7	J		0.01	< 10	U		0.01	4.9	J		0.01
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					3.5	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																					
2-Methylphenol	µg/l	540	< 5.4	U		5.4	< 5.0	U		5	< 4.8	U		4.8	< 4.8	U		4.8	< 4.0	U		4
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.4	U		5.4	< 5.0	U		5	< 4.8	U		4.8	< 4.8	U		4.8	< 4.0	U		4
Naphthalene	µg/l	100	2.3	J		5.4	< 5.0	U		5	1.2	J		4.8	< 4.8	U		4.8	< 4.0	U		4
N-Nitrosodibutylamine	µg/l	0.003	< 11	UJ		11	< 10	U		10	< 9.6	U		9.6	< 9.5	U		9.5	< 7.9	*U		7.9
N-Nitrosopyrrolidine	µg/l	0.03	< 11	UJ		11	< 10	U		10	< 9.6	U		9.6	< 9.5	U		9.5	< 7.9	*U		7.9
o-Toluidine	µg/l	0.2	< 11	UJ		11	< 10	U		10	2.7	J		9.6	< 9.5	U		9.5	< 7.9	U		7.9
Phenol	µg/l	2000	< 5.4	U		5.4	< 5.0	U		5	< 4.8	U		4.8	< 4.8	U		4.8	< 4.0	U		4
Pyridine	µg/l	9	< 27	U		27	< 25	U		25	< 24	U		24	< 24	U		24	< 20	U		20
Volatile Organic Compounds																						
1,1,1-Trichloroethane	µg/l	200	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,1,2-Trichloroethane	µg/l	5	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,1-Dichloroethane	µg/l	360	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,1-Dichloroethene	µg/l	7	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,2-Dichloroethane	µg/l	5	1.3			1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,2-Dichloropropane	µg/l	5	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,4-Dichlorobenzene	µg/l	75	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
1,4-Dioxane	µg/l	4	89			6.4	31			6.4	33	J		3.2	17			8	120			3.2
2-Butanone (MEK)	µg/l	4000	< 10	U		10	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Acetone	µg/l	5600	9.6	J		10	< 40	U		40	< 40	U		40	< 40	U		40	< 40	U		40
Acrylonitrile	µg/l	0.05	< 5.0	U		5	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Benzene	µg/l	5	11			1	2.1	J		4	6.8			4	< 4.0	U		4	6.6			4
Carbon tetrachloride	µg/l	5	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Chloroform	µg/l	80	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
cis/trans 1,2-Dichloroethene	µg/l	---																				
cis-1,2-Dichloroethene	µg/l	70	2.3			2	< 8.0	U		8	< 8.0	U		8	< 8.0	U		8	< 8.0	U		8
Dichloromethane (Methylene chloride)	µg/l	5	1.3			1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Ethyl benzene	µg/l	700	160			4	< 4.0	U		4	56			4	< 4.0	U		4	80			4
Ethyl methacrylate	µg/l	260	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
n-Propylbenzene	µg/l	52	19			1	5.2			4	12			4	3.6	J		4	9			4
Styrene	µg/l	100	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Tetrachloroethene	µg/l	5	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Tetrahydrofuran	µg/l	227	1100			20	140			20	460			20	71			20	730			20
Toluene	µg/l	1000	0.76	J		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	24			4
Trichloroethene	µg/l	5	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Vinyl Chloride	µg/l	2	< 1.0	U		1	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4	< 4.0	U		4
Xylenes (unspecified)	µg/l	10000	440			8	61			8	270			8	31			8	240			8

		Group	Southern Landfill Lobe															
		Sample ID / Date	GP-18 2014-05-06				GP-18 2014-10-03				GP-18 2015-05-07				GP-18 2015-10-27			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.17				0.16				0.22				0.26			
Iron, Ferrous	mg/l	---	1.5				2				2.5				2			
Oxidation Reduction Potential	mV	---	151.1				-116.3				-51.2				-38.3			
pH	SU	---	6.72				6.61				6.71				6.62			
Specific Conductance	µs/cm	---	748				850				594				628			
Temperature	CELSIUS	---	10.39				11.63				11.41				11.39			
Turbidity, field	NTU	---	2.39				1.5				2.2				4.5			
Metals																		
Antimony	µg/l	6					0.37	J		1	< 1.0	U		1	0.22	J		1
Antimony, dissolved	µg/l	6					0.38	J		1	< 1.0	U		1	0.2	J		1
Arsenic	µg/l	10					676			1	691			1	630			1
Arsenic, dissolved	µg/l	10					701	B		1	730			1	656			1
Beryllium	µg/l	4					0.031	J		0.7	0.06	J		0.7	0.036	J		0.7
Beryllium, dissolved	µg/l	4					< 0.70	U		0.7	0.059	J		0.7	< 0.70	U		0.7
Cadmium	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	µg/l	5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	µg/l	100					< 4.0	UJ		0.004	< 4.0	UJ		0.004	< 4.0	UJ		0.004
Chromium, dissolved	µg/l	100					2.5	J		0.004	1.3	J		0.004	1.3	J		0.004
Lead	µg/l	15	< 5.0	U		0.005	3.5	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15					4.6	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	µg/l	300					570			0.003	480	B		0.003	500			0.003
Manganese, dissolved	µg/l	300					560			0.003	450	B		0.003	520			0.003
Selenium	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	µg/l	50					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	µg/l	100					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	µg/l	2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	µg/l	2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	µg/l	2000					< 10	U		0.01	< 10	U		0.01	2.6	J		0.01
Zinc, dissolved	µg/l	2000					< 10	U		0.01	< 10	U		0.01	1.9	J		0.01
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 5.3	U		5.3
bis(2-Ethylhexyl) phthalate	µg/l	6	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 5.3	U		5.3
Naphthalene	µg/l	100	< 4.7	U		4.7	1.4	J		5	< 4.7	U		4.7	< 5.3	U		5.3
N-Nitrosodibutylamine	µg/l	0.003	< 9.3	U		9.3	< 9.9	U		9.9	< 9.5	U		9.5	< 11	UJ		11
N-Nitrosopyrrolidine	µg/l	0.03	< 9.3	UJ		9.3	< 9.9	U		9.9	< 9.5	U		9.5	< 11	UJ		11
o-Toluidine	µg/l	0.2	< 9.3	UJ		9.3	< 9.9	U		9.9	< 9.5	U		9.5	< 11	UJ		11
Phenol	µg/l	2000	< 4.7	U		4.7	< 5.0	U		5	< 4.7	U		4.7	< 5.3	U		5.3
Pyridine	µg/l	9	< 23	U		23	< 25	U		25	< 24	U		24	< 27	U		27
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,1,2-Trichloroethane	µg/l	5	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,1-Dichloroethane	µg/l	360	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,1-Dichloroethene	µg/l	7	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,2-Dichloroethane	µg/l	5	< 2.0	U		2	6.8	J		10	< 10	U		10	< 2.0	U		2
1,2-Dichloropropane	µg/l	5	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,4-Dichlorobenzene	µg/l	75	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
1,4-Dioxane	µg/l	4	45			3.2	95			3.2	< 3.2	U		3.2	27			6.4
2-Butanone (MEK)	µg/l	4000	< 20	U		20	< 100	U		100	< 100	U		100	< 20	U		20
Acetone	µg/l	5600	< 20	U		20	< 100	U		100	< 100	U		100	< 20	U		20
Acrylonitrile	µg/l	0.05	< 10	U		10	< 50	U		50	< 50	U		50	< 10	U		10
Benzene	µg/l	5	3.2			2	8	J		10	< 10	U		10	3.5			2
Carbon tetrachloride	µg/l	5	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Chloroform	µg/l	80	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
cis/trans 1,2-Dichloroethene	µg/l	---																
cis-1,2-Dichloroethene	µg/l	70	2.3	J		4	< 20	U		20	< 20	U		20	< 4.0	U		4
Dichloromethane (Methylene chloride)	µg/l	5	2.2			2	< 10	U		10	< 10	U		10	< 2.0	U		2
Ethyl benzene	µg/l	700	1.8	J		2	100			10	< 10	U		10	5.1			2
Ethyl methacrylate	µg/l	260	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
n-Propylbenzene	µg/l	52	5.7			2	20			10	< 10	U		10	6.9			2
Styrene	µg/l	100	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Tetrachloroethene	µg/l	5	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Tetrahydrofuran	µg/l	227	220			10	570			50	79			50	260			10
Toluene	µg/l	1000	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Trichloroethene	µg/l	5	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Vinyl Chloride	µg/l	2	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2
Xylenes (unspecified)	µg/l	10000	71			4	360			20	25			20	150			4

		Group	Southern Landfill Lobe															
		Sample ID / Date	GP-18 2017-03-30				GP-18 2017-06-29				GP-18 2017-08-08				GP-18 2017-10-13			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.99				0.13				0.07				0.27			
Iron, Ferrous	mg/l	---					3				4				2.5			
Oxidation Reduction Potential	mV	---	-91.6				-111.7				-108.5				-86.3			
pH	SU	---	6.8				6.72				6.66				6.56			
Specific Conductance	µs/cm	---	651				601				682				849			
Temperature	CELSIUS	---	9.57				12.07				12.42				11.46			
Turbidity, field	NTU	---	12.4				4.19				4.68				3.14			
Metals																		
Antimony	µg/l	6																
Antimony, dissolved	µg/l	6																
Arsenic	µg/l	10	650			1.0	571			1.0	590			1.0	562			1.0
Arsenic, dissolved	µg/l	10	604			1.0	570			1.0	603			1.0	603			1.0
Beryllium	µg/l	4																
Beryllium, dissolved	µg/l	4																
Cadmium	µg/l	5																
Cadmium, dissolved	µg/l	5																
Chromium	µg/l	100																
Chromium, dissolved	µg/l	100																
Lead	µg/l	15																
Lead, dissolved	µg/l	15																
Manganese	µg/l	300	660			0.0030	505			3.0	562	B		3.0	375			3.0
Manganese, dissolved	µg/l	300	630			0.0030	484			3.0	542	B		3.0	339	B		3.0
Selenium	µg/l	50																
Selenium, dissolved	µg/l	50																
Silver	µg/l	100																
Silver, dissolved	µg/l	100																
Thallium	µg/l	2																
Thallium, dissolved	µg/l	2																
Zinc	µg/l	2000																
Zinc, dissolved	µg/l	2000																
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540													< 25	U		25
bis(2-Ethylhexyl) phthalate	µg/l	6													< 25	U		25
Naphthalene	µg/l	100													< 25	U		25
N-Nitrosodibutylamine	µg/l	0.003													< 50	U		50
N-Nitrosopyrrolidine	µg/l	0.03													< 50	U		50
o-Toluidine	µg/l	0.2													< 50	U		50
Phenol	µg/l	2000													< 25	U		25
Pyridine	µg/l	9													< 130	U		130
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1,2-Trichloroethane	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1-Dichloroethane	µg/l	360	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,1-Dichloroethene	µg/l	7	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,2-Dichloroethane	µg/l	5	< 2.0	U		2.0	0.43	J	J	1.0	0.99	J		4.0	< 4.0	U		4.0
1,2-Dichloropropane	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,4-Dichlorobenzene	µg/l	75	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
1,4-Dioxane	µg/l	4	40			8.0	17			8.0	41			8.0	37			16
2-Butanone (MEK)	µg/l	4000	< 20	U		20	< 10	U	U	10	< 40	U		40	< 40	U		40
Acetone	µg/l	5600	< 20	U		20	4.2	J	JR	10	< 40	U		40	< 40	U		40
Acrylonitrile	µg/l	0.05	< 10	U		10	< 5.0	U	U	5.0	< 20	U		20	< 20	U		20
Benzene	µg/l	5	3.6			2.0	1.5			1.0	4.6			4.0	5.6			4.0
Carbon tetrachloride	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Chloroform	µg/l	80	< 2.0	U	UJ	2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
cis/trans 1,2-Dichloroethene	µg/l	---	< 4.0	U		4.0	1.0	J	J	2.0	< 8.0	U		8.0	< 8.0	U		8.0
cis-1,2-Dichloroethene	µg/l	70	< 2.0	U		2.0	1.0			1.0	< 4.0	U		4.0	< 4.0	U		4.0
Dichloromethane (Methylene chloride)	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Ethyl benzene	µg/l	700	1.6	J		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Ethyl methacrylate	µg/l	260	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
n-Propylbenzene	µg/l	52	3.4			2.0	3.0			1.0	7.6			4.0	9.7			4.0
Styrene	µg/l	100	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Tetrachloroethene	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Tetrahydrofuran	µg/l	227	200			10	66			5.0	230			20	250			20
Toluene	µg/l	1000	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Trichloroethene	µg/l	5	< 2.0	U		2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Vinyl Chloride	µg/l	2	< 2.0	U	UJ	2.0	< 1.0	U	U	1.0	< 4.0	U		4.0	< 4.0	U		4.0
Xylenes (unspecified)	µg/l	10000	42			4.0	4.5			2.0	19			8.0	110			8.0

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group: Southern Landfill Lobe		Sample ID / Date	GP-21 2011-09-19				GP-21 2012-03-30				GP-21 2012-09-21				GP-21 2013-03-22				GP-21 2013-09-24				GP-21 2014-05-06			
Parameter	**Units**	**Groundwater Performance Standards (µg/L)**	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																										
Dissolved Oxygen	mg/l	---	1.47				0.41				NA				2.4				1.16				0.25			
Iron, Ferrous	mg/l	---	6.2				3.3				NA				1.94				1.19				3			
Oxidation Reduction Potential	mV	---	-100.5				-81.8				NA				-100.9				-67				129.1			
pH	SU	---	6.28				6.53				NA				6.94				6.53				6.44			
Specific Conductance	µs/cm	---	2067				175				NA				1363				1514				1124			
Temperature	CELSIUS	---	11.73				8.79				NA				7.97				12.8				9.28			
Turbidity, field	NTU	---	1.62				0.94				NA				1.85				5.3				0.62			
Metals																										
Antimony	µg/l	6	1.1			1	1.6			1	1.5			1	< 1.0	U		1	0.88	J		1				
Antimony, dissolved	µg/l	6	1.1			1	1.6			1	1.5			1					0.81	J		1				
Arsenic	µg/l	10	291			1	247			1	223			1	237			1	216			1				
Arsenic, dissolved	µg/l	10	289			1	286			1	232			1					207			1				
Beryllium	µg/l	4	< 0.70	U		0.7	0.039	J		0.7	0.04	J		0.7	0.031	J		0.7	0.045	J		0.7				
Beryllium, dissolved	µg/l	4	< 0.70	U		0.7	0.032	J		0.7	0.038	J		0.7					< 0.70	U		0.7				
Cadmium	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5				
Cadmium, dissolved	µg/l	5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					0.26	J		0.5				
Chromium	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	1.8	J		0.004	1.4	J		0.004	1.6	J		0.004				
Chromium, dissolved	µg/l	100	< 4.0	U		0.004	< 4.0	U		0.004	2.1	J		0.004					< 4.0	U		0.004				
Lead	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	µg/l	15	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005				
Manganese	µg/l	300	1200			0.003	1200			0.003	710			0.003	480			0.003	610			0.003				
Manganese, dissolved	µg/l	300	1200			0.003	1100			0.003	810			0.003					620			0.003				
Selenium	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Selenium, dissolved	µg/l	50	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015				
Silver	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Silver, dissolved	µg/l	100	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003				
Thallium	µg/l	2	0.28			0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Thallium, dissolved	µg/l	2	0.2			0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2				
Zinc	µg/l	2000	< 10	U		0.01	2.6	J		0.01	2.6	J		0.01	2.5	J		0.01	7.8	J		0.01				
Zinc, dissolved	µg/l	2000	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					2.4	J		0.01				
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																									
2-Methylphenol	µg/l	540	< 5.0	U		5	< 4.7	U		4.7	< 4.8	U		4.8	< 4.7	U		4.7	< 3.9	U		3.9	< 4.6	U		4.6
bis(2-Ethylhexyl) phthalate	µg/l	6	< 5.0	U		5	< 4.7	U		4.7	< 4.8	U		4.8	< 4.7	*U		4.7	< 3.9	U		3.9	< 4.6	U		4.6
Naphthalene	µg/l	100	2.9	J		5	3.5	J		4.7	3.6	J		4.8	2.3	J		4.7	< 3.9	U		3.9	2.7	J		4.6
N-Nitrosodibutylamine	µg/l	0.003	< 9.9	UJ		9.9	< 9.4	U		9.4	< 9.6	U		9.6	< 9.4	U		9.4	< 7.8	*U		7.8	< 9.3	U		9.3
N-Nitrosopyrrolidine	µg/l	0.03	< 9.9	UJ		9.9	< 9.4	U		9.4	< 9.6	U		9.6	< 9.4	U		9.4	< 7.8	*U		7.8	< 9.3	UJ		9.3
o-Toluidine	µg/l	0.2	< 9.9	UJ		9.9	22			9.4	3.8	J		9.6	1.8	J		9.4	< 7.8	U		7.8	< 9.3	UJ		9.3
Phenol	µg/l	2000	< 5.0	U		5	< 4.7	U		4.7	< 4.8	U		4.8	< 4.7	U		4.7	< 3.9	U		3.9	< 4.6	U		4.6
Pyridine	µg/l	9	< 25	U		25	< 24	U		24	< 24	U		24	< 24	U		24	< 20	U		20	< 23	U		23
Volatile Organic Compounds																										
1,1,1-Trichloroethane	µg/l	200	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,1,2-Trichloroethane	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,1-Dichloroethane	µg/l	360	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,1-Dichloroethene	µg/l	7	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,2-Dichloroethane	µg/l	5	< 4.0	U		4	3	J		5	< 20	U		20	1.6	J		4	< 4.0	U		4	< 20	U		20
1,2-Dichloropropane	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,4-Dichlorobenzene	µg/l	75	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
1,4-Dioxane	µg/l	4	53			6.4	52			6.4	57	J		3.2	59			16	110			16	54			16
2-Butanone (MEK)	µg/l	4000	< 40	U		40	< 50	U		50	< 200	U		200	< 40	U		40	< 40	U		40	< 200	U		200
Acetone	µg/l	5600	< 40	U		40	< 50	U		50	< 200	U		200	13	J		40	< 40	U		40	< 200	U		200
Acrylonitrile	µg/l	0.05	< 20	U		20	< 25	U		25	< 100	U		100	< 20	U		20	< 20	U		20	< 100	U		100
Benzene	µg/l	5	34			4	38			5	28			20	18			4	19			4	24			20
Carbon tetrachloride	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Chloroform	µg/l	80	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
cis/trans 1,2-Dichloroethene	µg/l	---																								
cis-1,2-Dichloroethene	µg/l	70	< 8.0	U		8	< 10	U		10	< 40	U		40	< 8.0	U		8	< 8.0	U		8	< 40	U		40
Dichloromethane (Methylene chloride)	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Ethyl benzene	µg/l	700	320			4	190			5	28			20	49			4	28			4	45			20
Ethyl methacrylate	µg/l	260	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
n-Propylbenzene	µg/l	52	92			4	97			5	79			20	46			4	40			4	43			20
Styrene	µg/l	100	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Tetrachloroethene	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Tetrahydrofuran	µg/l	227	3000			100	2800			100	1800			100	1100			20	1400			20	910			100
Toluene	µg/l	1000	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	14			4	< 20	U		20
Trichloroethene	µg/l	5	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Vinyl Chloride	µg/l	2	< 4.0	U		4	< 5.0	U		5	< 20	U		20	< 4.0	U		4	< 4.0	U		4	< 20	U		20
Xylenes (unspecified)	µg/l	10000	2800			40	3200			40	2500			40	610			8	1300			20	1200			40

Sample ID / Date	GP-21 2014-10-03				GP-21 2015-05-07				GP-21 2015-10-27				GP-21 2017-03-30				GP-21 2017-06-29				GP-21 2017-08-08				GP-21 2017-10-13			
Parameter	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL
Field Parameters																												
Dissolved Oxygen	0.2				0.12				0.2				1.27				0.12				0.12				0.3			
Iron, Ferrous	3.5				4				2								7				3				2.0			
Oxidation Reduction Potential	-100.8				-68				-22.1				-66.1				-106.2				-70				-53.1			
pH	6.28				6.46				6.52				667				6.44				6.38				6.3			
Specific Conductance	915				1006				1055				807				950				751				654			
Temperature					10.16				10.36				8.82				11.7				11.99				10.21			
Turbidity, field	0.88				0.33				4				26.6				5.61				6.85				3.09			
Metals																												
Antimony	1.1			1	0.41	J		1	0.36	J		1																
Antimony, dissolved	1.2			1	0.44	J		1	0.36	J		1																
Arsenic	231			1	221			1	242			1	243			1.0	238			1.0	262			1.0	210			1.0
Arsenic, dissolved	242	B		1	235			1	227			1	237			1.0	240			1.0	289			1.0	243			1.0
Beryllium	< 0.70	UJ		0.7	< 0.70	UJ		0.7	< 0.70	U		0.7																
Beryllium, dissolved	0.031	J		0.7	0.031	J		0.7	< 0.70	U		0.7																
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5																
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5																
Chromium	< 4.0	UJ		0.004	< 4.0	UJ		0.004	1.3	J		0.004																
Chromium, dissolved	2.6	J		0.004	1.5	J		0.004	1.3	J		0.004																
Lead	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005																
Lead, dissolved	5.6	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005																
Manganese	510			0.003	340	B		0.003	370			0.003	590			0.0030	586			3.0	541	B		3.0	642			3.0
Manganese, dissolved	520			0.003	350			0.003	360			0.003	600			0.0030	597			3.0	533	B		3.0	544	B		3.0
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015																
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015																
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003																
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003																
Thallium	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2																
Thallium, dissolved	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2																
Zinc	< 10	U		0.01	< 10	UJ		0.01	< 10	U		0.01																
Zinc, dissolved	< 10	U		0.01	6.5	J		0.01	2.9	J		0.01																
Semi Volatile Organic Compounds																												
2-Methylphenol	< 5.0	U		5	< 4.7	U		4.7	< 5.1	U		5.1													< 25	U		25
bis(2-Ethylhexyl) phthalate	< 5.0	U		5	< 4.7	U		4.7	< 5.1	U		5.1													< 25	U		25
Naphthalene	3.7	J		5	1.4	J		4.7	1.5	J		5.1													< 25	U		25
N-Nitrosodibutylamine	< 10	U		10	< 9.3	U		9.3	< 10	UJ		10													< 50	U		50
N-Nitrosopyrrolidine	< 10	U		10	< 9.3	U		9.3	< 10	UJ		10													< 50	U		50
o-Toluidine	< 10	U		10	< 9.3	U		9.3	1.7	J		10													< 50	U		50
Phenol	< 5.0	U		5	< 4.7	U		4.7	< 5.1	U		5.1													< 25	U		25
Pyridine	< 25	U		25	< 23	U		23	< 26	U		26													< 130	U		130
Volatile Organic Compounds																												
1,1,1-Trichloroethane	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,1,2-Trichloroethane	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,1-Dichloroethane	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,1-Dichloroethene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,2-Dichloroethane	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,2-Dichloropropane	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,4-Dichlorobenzene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
1,4-Dioxane	90			16	78			16	99			6.4	53			16	64			16	530			16	45			16
2-Butanone (MEK)	< 500	U		500	< 100	U		100	< 100	U		100	< 50	U		50	< 50	U	U	50	< 50	U		50	< 50	U		50
Acetone	< 500	U		500	< 100	U		100	< 100	U		100	< 50	U		50	< 50	U	U	50	< 50	U		50	< 50	U		50
Acrylonitrile	< 250	U		250	< 50	U		50	< 50	U		50	< 25	U		25	< 25	U	U	25	< 25	U		25	< 25	U		25
Benzene	32	J		50	10			10	9.2	J		10	4.0	J		5.0	5.0			5.0	5.8			5.0	4.3	J		5.0
Carbon tetrachloride	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Chloroform	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U	UJ	5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
cis/trans 1,2-Dichloroethene													< 10	U		10	< 10	U	U	10	< 10	U		10	< 10	U		10
cis-1,2-Dichloroethene	< 100	U		100	< 20	U		20	< 20	U		20	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Dichloromethane (Methylene chloride)	< 50	U		50	< 10	U		10	4.6	J		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Ethyl benzene	46	J		50	14			10	12			10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Ethyl methacrylate	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
n-Propylbenzene	82			50	19			10	13			10	4.9	J		5.0	8.7			5.0	10			5.0	6.4			5.0
Styrene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Tetrachloroethene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Tetrahydrofuran	1700			250	880			50	750			50	260			25	280			25	400			25	210			25
Toluene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Trichloroethene	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U		5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Vinyl Chloride	< 50	U		50	< 10	U		10	< 10	U		10	< 5.0	U	UJ	5.0	< 5.0	U	U	5.0	< 5.0	U		5.0	< 5.0	U		5.0
Xylenes (unspecified)	2400			100	240			20	160			20	71			10	98			10	130			10	62			10

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group SOUTHERN LANDFILL LOBE

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-110 2017-03-28 Result	LQual	VQual	RL	MW-110 2017-06-28 Result	LQual	VQual	RL	MW-110 2017-08-08 Result	LQual	VQual	RL	MW-110 2017-10-12 Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.08				4.94				0.6				7.2			
Iron, Ferrous	mg/l	---					5				5				4.5			
Oxidation Reduction Potential	mV	---	-87.1				-104.2				-127.2				-105.4			
pH	SU	---	7.01				5.64				7.06				6.74			
Specific Conductance	µs/cm	---	2331				2242				2337				3040			
Temperature	CELSIUS	---	6.32				14.25				15.78				15.48			
Turbidity, field	NTU	---	471				42				473				300.1			
Metals																		
Antimony	µg/l	6																
Antimony, dissolved	µg/l	6																
Arsenic	µg/l	10	139			1.0	117			1.0	115			1.0	88.1			1.0
Arsenic, dissolved	µg/l	10	62.4			1.0	112			1.0	99.9			1.0	85.8			1.0
Beryllium	µg/l	4																
Beryllium, dissolved	µg/l	4																
Cadmium	µg/l	5																
Cadmium, dissolved	µg/l	5																
Chromium	µg/l	100																
Chromium, dissolved	µg/l	100																
Lead	µg/l	15																
Lead, dissolved	µg/l	15																
Manganese	µg/l	300	1600			0.0030	658			3.0	1730	B		3.0	1520			3.0
Manganese, dissolved	µg/l	300	110			0.0030	99.7			3.0	97.1	B		3.0	226	B		3.0
Selenium	µg/l	50																
Selenium, dissolved	µg/l	50																
Silver	µg/l	100																
Silver, dissolved	µg/l	100																
Thallium	µg/l	2																
Thallium, dissolved	µg/l	2																
Zinc	µg/l	2000																
Zinc, dissolved	µg/l	2000																
Semi Volatile Organic Compounds	**Semi Volatile Organic Cor**																	
2-Methylphenol	µg/l	540													< 27	U		27
bis(2-Ethylhexyl) phthalate	µg/l	6													< 27	U		27
Naphthalene	µg/l	100													< 27	U		27
N-Nitrosodibutylamine	µg/l	0.003													< 53	U		53
N-Nitrosopyrrolidine	µg/l	0.03													< 53	U		53
o-Toluidine	µg/l	0.2													< 53	U		53
Phenol	µg/l	2000													< 27	U		27
Pyridine	µg/l	9													< 130	U		130
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 20	U		20	< 20	U	U	20	< 20	U		20	< 20	U		20
1,1,2-Trichloroethane	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,1-Dichloroethane	µg/l	360	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,1-Dichloroethene	µg/l	7	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,2-Dichloroethane	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,2-Dichloropropane	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,4-Dichlorobenzene	µg/l	75	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
1,4-Dioxane	µg/l	4	770			160	760			160	630			160	590			16
2-Butanone (MEK)	µg/l	4000	< 200	U	UJ	200	< 200	U	UJ	200	< 200	U		200	< 200	U		200
Acetone	µg/l	5600	< 200	U	UJ	200	< 200	U	UJ	200	< 200	U		200	< 200	U		200
Acrylonitrile	µg/l	0.05	< 100	U	UJ	100	< 100	U	UJ	100	< 100	U		100	< 100	U		100
Benzene	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	9.3	J		20	9.0	J		20
Carbon tetrachloride	µg/l	5	< 20	U	J	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Chloroform	µg/l	80	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
cis/trans 1,2-Dichloroethene	µg/l	---	< 40	U	UJ	40	< 40	U	U	40	< 40	U		40	< 40	U		40
cis-1,2-Dichloroethene	µg/l	70	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Dichloromethane (Methylene chloride)	µg/l	5	16	J	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Ethyl benzene	µg/l	700	50		UJ	20	35		J	20	160			20	91			20
Ethyl methacrylate	µg/l	260	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
n-Propylbenzene	µg/l	52	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Styrene	µg/l	100	< 20	U	J	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Tetrachloroethene	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Tetrahydrofuran	µg/l	227	3500		J	100	3600		J	100	4700			200	3800			100
Toluene	µg/l	1000	14	J	UJ	20	17	J	J	20	31			20	18	J		20
Trichloroethene	µg/l	5	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Vinyl Chloride	µg/l	2	< 20	U	UJ	20	< 20	U	UJ	20	< 20	U		20	< 20	U		20
Xylenes (unspecified)	µg/l	10000	360		J	40	350		J	40	580			40	300			40

Parameter	MW-4B 2011-09-19 Result	LQual	VQual	RL	MW-4B 2012-03-27 Result	LQual	VQual	RL	MW-4B 2012-09-21 Result	LQual	VQual	RL	MW-4B 2013-03-22 Result	LQual	VQual	RL	MW-4B 2013-09-24 Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	0.18				0.71				NA				0.14				0.91			
Iron, Ferrous	7.2				2.49				NA								1.52			
Oxidation Reduction Potential	-105.2				-251.4				NA				-125.4				-92			
pH	6.47				6.55				NA				6.71				6.6			
Specific Conductance	2012				305				NA				1931				2615			
Temperature	10.96				8.78				NA				8.09				12.1			
Turbidity, field	13.2				4.6				NA				4.45				11			
Metals																				
Antimony	< 1.0	U		1	1.2			1	< 1.0	U		1	1.1			1	0.73	J		1
Antimony, dissolved	< 1.0	U		1	1.3			1	< 1.0	U		1					0.74	J		1
Arsenic	1090			10	1480			5	1020			5	1310			5	1070			10
Arsenic, dissolved	1040			10	1590			5	1180			5					1180			10
Beryllium	0.034	J		0.7	< 0.70	U		0.7	0.044	J		0.7	0.037	J		0.7	0.056	J		0.7
Beryllium, dissolved	< 0.70	UJ		0.7	< 0.70	U		0.7	0.03	J		0.7					0.035	J		0.7
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5					< 0.50	U		0.5
Chromium	1.2	J		0.004	1.8	J		0.004	1.8	J		0.004	2	J		0.004	1.4	J		0.004
Chromium, dissolved	< 4.0	U		0.004	2.1	J		0.004	1.7	J		0.004					1.7	J		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005					< 5.0	U		0.005
Manganese	160			0.003	120			0.003	100			0.003	110			0.003	170			0.003
Manganese, dissolved	150			0.003	130			0.003	110			0.003					110			0.003
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015					< 15	U		0.015
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003					< 3.0	U		0.003
Thallium	0.2			0.2	< 0.20	UJ		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	0.12	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2					< 0.20	U		0.2
Zinc	< 10	U		0.01	1.5	J		0.01	1.9	J		0.01	3.4	J		0.01	3	J		0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01					1.7	J		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol	5.7			4.7	7			4.9	0.53	J		4.9	20	J		48	3.2	J		3.9
bis(2-Ethylhexyl) phthalate	< 4.7	U		4.7	< 4.9	U		4.9	< 4.9	U		4.9	< 48	*U		48	< 3.9	U		3.9
Naphthalene	2.6	J		4.7	3.5	J		4.9	3.8	J		4.9	< 48	U		48	3.4	J		3.9
N-Nitrosodibutylamine	< 9.4	UJ		9.4	< 9.8	U		9.8	< 9.9	U		9.9	< 95	U		95	< 7.9	*U		7.9
N-Nitrosopyrrolidine	< 9.4	UJ		9.4	< 9.8	U		9.8	< 9.9	U		9.9	< 95	U		95	< 7.9	*U		7.9
o-Toluidine	2.4	J		9.4	< 9.8	U		9.8	8.7	J		9.9	< 95	U		95	< 7.9	U		7.9
Phenol	< 4.7	U		4.7	< 4.9	U		4.9	< 4.9	U		4.9	< 48	U		48	< 3.9	U		3.9
Pyridine	< 24	U		24	< 24	U		24	< 25	U		25	< 240	U		240	< 20	U		20
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
1,1,2-Trichloroethane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
1,1-Dichloroethane	2.3			2	< 10	U		10	< 10	U		10	2.2			2	< 10	U		10
1,1-Dichloroethene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
1,2-Dichloroethane	3.1			2	< 10	U		10	< 10	U		10	3.1			2	< 10	U		10
1,2-Dichloropropane	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
1,4-Dichlorobenzene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
1,4-Dioxane	290	J		3.2	390	J		6.4	420	J		1.6	550			16	590			16
2-Butanone (MEK)	< 20	U		20	< 100	U		100	< 100	U		100	7.9	J		20	< 100	U		100
Acetone	19	J		20	< 100	U		100	< 100	U		100	31			20	< 100	U		100
Acrylonitrile	< 10	U		10	< 50	U		50	< 50	U		50	< 10	U		10	< 50	U		50
Benzene	17			2	18			10	18			10	20			2	15			10
Carbon tetrachloride	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
Chloroform	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
cis/trans 1,2-Dichloroethene																				
cis-1,2-Dichloroethene	16			4	15	J		20	8.3	J		20	31			4	11	J		20
Dichloromethane (Methylene chloride)	1	J		2	< 10	U		10	< 10	U		10	0.95	J		2	< 10	U		10
Ethyl benzene	170			2	180			10	190			10	160			2	160			10
Ethyl methacrylate	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
n-Propylbenzene	7.9			2	9.9	J		10	8.2	J		10	7.7			2	< 10	U		10
Styrene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
Tetrachloroethene	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
Tetrahydrofuran	3000			50	3200			50	3100			50	2900			50	2700			50
Toluene	160			2	120			10	10			10	410			10	42			10
Trichloroethene	2			2	< 10	U		10	< 10	U		10	3.1			2	< 10	U		10
Vinyl Chloride	< 2.0	U		2	< 10	U		10	< 10	U		10	< 2.0	U		2	< 10	U		10
Xylenes (unspecified)	510			4	580			20	570			20	500			4	500			20

Parameter	MW-4B 2014-05-06 Result	LQual	VQual	RL	MW-4B 2014-10-03 Result	LQual	VQual	RL	MW-4B 2015-05-07 Result	LQual	VQual	RL	MW-4B 2015-10-26 Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.1				0.26				0.01				0.4			
Iron, Ferrous	2.5				3				2				2			
Oxidation Reduction Potential	-189.1				-115.3				-60.9				-93.3			
pH	6.38				6.06				6.54				6.3			
Specific Conductance	1599				1524				2935				2421			
Temperature	10.69				11.41				11.15				12.55			
Turbidity, field	4.89				3.9				4.91				5.41			
Metals																
Antimony					0.76	J		1	0.81	J		1	0.85	J		1
Antimony, dissolved					0.72	J		1	0.91	J		1	0.77	J		1
Arsenic					2150			5	1950			5	1390			2
Arsenic, dissolved					2150	B		5	2070			5	1360			2
Beryllium					0.049	J		0.7	< 0.70	UJ		0.7	< 0.70	^U		0.7
Beryllium, dissolved					0.044	J		0.7	0.085	J		0.7	< 0.70	U		0.7
Cadmium					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved					< 0.50	U		0.5	< 0.50	U		0.5	< 1.0	U		1
Chromium					< 4.0	UJ		0.004	1.7	J		0.004	2.2	J		0.004
Chromium, dissolved					2.2	J		0.004	< 4.0	U		0.004	1.6	J		0.004
Lead	< 5.0	U		0.005	6.3			0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved					5.2			0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese					110			0.003	100	J		0.003	92	B		0.003
Manganese, dissolved					110			0.003	360	J		0.003	92			0.003
Selenium					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium					< 0.20	U		0.2	< 0.20	UJ		0.2	< 0.20	U		0.2
Thallium, dissolved					< 0.20	U		0.2	0.022	J		0.2	< 0.20	^U		0.2
Zinc					< 10	U		0.01	< 10	U		0.01	1.7	J		0.01
Zinc, dissolved					< 10	U		0.01	< 10	U		0.01	2	J		0.01
Semi Volatile Organic Compounds																
2-Methylphenol	< 4.7	U		4.7	< 5.0	U		5	< 23	U		23	< 24	U		24
bis(2-Ethylhexyl) phthalate	< 4.7	U		4.7	< 5.0	U		5	< 23	U		23	< 24	U		24
Naphthalene	5			4.7	3.5	J		5	< 23	U		23	< 24	U		24
N-Nitrosodibutylamine	< 9.3	UJ		9.3	< 10	U		10	< 47	U		47	< 48	UJ		48
N-Nitrosopyrrolidine	< 9.3	UJ		9.3	< 10	U		10	< 47	U		47	< 48	UJ		48
o-Toluidine	< 9.3	UJ		9.3	< 10	U		10	< 47	U		47	< 48	UJ		48
Phenol	< 4.7	U		4.7	< 5.0	U		5	< 23	U		23	< 24	U		24
Pyridine	< 23	U		23	< 25	U		25	< 120	U		120	< 120	U		120
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,1,2-Trichloroethane	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,1-Dichloroethane	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,1-Dichloroethene	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,2-Dichloroethane	< 20	U		20	4.9	J		20	< 20	U		20	5.3	J		20
1,2-Dichloropropane	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,4-Dichlorobenzene	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
1,4-Dioxane	510			16	500			16	790			16	630			32
2-Butanone (MEK)	< 200	U		200	< 200	U		200	< 200	U		200	< 200	U		200
Acetone	< 200	U		200	< 200	U		200	< 200	U		200	< 200	U		200
Acrylonitrile	< 100	U		100	< 100	U		100	< 100	U		100	< 100	U		100
Benzene	23			20	21			20	24			20	20			20
Carbon tetrachloride	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Chloroform	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	16	J		40	16	J		40	< 40	U		40	< 40	U		40
Dichloromethane (Methylene chloride)	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Ethyl benzene	240			20	240			20	290			20	190			20
Ethyl methacrylate	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
n-Propylbenzene	< 20	U		20	< 20	U		20	16	J		20	< 20	U		20
Styrene	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Tetrachloroethene	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Tetrahydrofuran	3900			100	3800			100	6100			250	6800			250
Toluene	42			20	59			20	14	J		20	< 20	U		20
Trichloroethene	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Vinyl Chloride	< 20	U		20	< 20	U		20	< 20	U		20	< 20	U		20
Xylenes (unspecified)	730			40	790			40	910			40	690			40

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group SOUTHERN LANDFILL LOBE

Parameter	Units	Groundwater Performance Standards (µg/L)	MW-4B 2017-03-28 Result	LQual	VQual	RL	MW-4B 2017-06-28 Result	LQual	VQual	RL	MW-4B 2017-08-07 Result	LQual	VQual	RL	MW-4B 2017-10-12 Result	LQual	VQual	RL
Field Parameters																		
Dissolved Oxygen	mg/l	---	0.07				0.12				0.44				0.31			
Iron, Ferrous	mg/l	---					2.5				7				7.0			
Oxidation Reduction Potential	mV	---	-85.5				-85.5				-99.5				-101.4			
pH	SU	---	6.77				6.65				6.48				6.33			
Specific Conductance	µs/cm	---	2994				3343				2699				3.58			
Temperature	CELSIUS	---	8.81				12.44				14.73				14.5			
Turbidity, field	NTU	---	27.2				6				7.27				9.81			
Metals																		
Antimony	µg/l	6																
Antimony, dissolved	µg/l	6																
Arsenic	µg/l	10	2120			5.0	1920			100	1830	^		500	1330			10.0
Arsenic, dissolved	µg/l	10	2130			5.0	1780			2.0	1680			500	1130			100
Beryllium	µg/l	4																
Beryllium, dissolved	µg/l	4																
Cadmium	µg/l	5																
Cadmium, dissolved	µg/l	5																
Chromium	µg/l	100																
Chromium, dissolved	µg/l	100																
Lead	µg/l	15																
Lead, dissolved	µg/l	15																
Manganese	µg/l	300	120			0.0030	95.3			3.0	103	B		3.0	74.5	B		3.0
Manganese, dissolved	µg/l	300	94			0.0030	84.2			3.0	94.1	B		3.0	81.7	B		3.0
Selenium	µg/l	50																
Selenium, dissolved	µg/l	50																
Silver	µg/l	100																
Silver, dissolved	µg/l	100																
Thallium	µg/l	2																
Thallium, dissolved	µg/l	2																
Zinc	µg/l	2000																
Zinc, dissolved	µg/l	2000																
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																	
2-Methylphenol	µg/l	540													< 25	U		25
bis(2-Ethylhexyl) phthalate	µg/l	6													< 25	U		25
Naphthalene	µg/l	100													< 25	U		25
N-Nitrosodibutylamine	µg/l	0.003													< 50	U		50
N-Nitrosopyrrolidine	µg/l	0.03													< 50	U		50
o-Toluidine	µg/l	0.2													8.6	J		50
Phenol	µg/l	2000													< 25	U		25
Pyridine	µg/l	9													< 130	U		130
Volatile Organic Compounds																		
1,1,1-Trichloroethane	µg/l	200	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,1,2-Trichloroethane	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,1-Dichloroethane	µg/l	360	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,1-Dichloroethene	µg/l	7	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,2-Dichloroethane	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,2-Dichloropropane	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,4-Dichlorobenzene	µg/l	75	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
1,4-Dioxane	µg/l	4	1000	F1		40	1300			40	900		J	40	1000			40
2-Butanone (MEK)	µg/l	4000	< 1000	U		1000	< 1000	U	U	1000	< 1000	U	J	1000	< 1000	U		1000
Acetone	µg/l	5600	< 1000	U		1000	< 1000	U	U	1000	< 1000	U	J	1000	< 1000	U		1000
Acrylonitrile	µg/l	0.05	< 500	U		500	< 500	U	U	500	< 500	U	J	500	< 500	U		500
Benzene	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Carbon tetrachloride	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Chloroform	µg/l	80	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
cis/trans 1,2-Dichloroethene	µg/l	---	< 200	U		200	< 200	U	U	200	< 200	U	J	200	1500	F1	J	200
cis-1,2-Dichloroethene	µg/l	70	< 100	U		100	< 100	U	U	100	< 100	U	J	100	1500	F1	J	100
Dichloromethane (Methylene chloride)	µg/l	5	< 100	U		100	67	J	J	100	< 100	U	J	100	70	J	J	100
Ethyl benzene	µg/l	700	200			100	250			100	220	J	J	100	< 100	U	U	100
Ethyl methacrylate	µg/l	260	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
n-Propylbenzene	µg/l	52	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Styrene	µg/l	100	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Tetrachloroethene	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	1000	F1	J	100
Tetrahydrofuran	µg/l	227	8300			500	8200			500	9400	J	J	500	< 500	U F1	J	500
Toluene	µg/l	1000	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Trichloroethene	µg/l	5	< 100	U		100	< 100	U	U	100	< 100	U	J	100	4000	F1	J	100
Vinyl Chloride	µg/l	2	< 100	U		100	< 100	U	U	100	< 100	U	J	100	< 100	U		100
Xylenes (unspecified)	µg/l	10000	780			200	860			200	750		J	200	< 200	U	U	200

Parameter	MW-4S 2011-09-19 Result	LQual	VQual	RL	MW-4S 2012-03-27 Result	LQual	VQual	RL	MW-4S 2012-09-21 Result	LQual	VQual	RL	MW-4S 2013-03-22 Result	LQual	VQual	RL
Field Parameters																
Dissolved Oxygen	0.08				0.92				NA				2.8			
Iron, Ferrous	6.8				2.02				NA				1.43			
Oxidation Reduction Potential	-102.7				-250.6				NA				-116.5			
pH	6.37				6.46				NA				6.79			
Specific Conductance	3878				342				NA				2701			
Temperature	11.71				9.5				NA				7.53			
Turbidity, field	11				20.6				NA				9.02			
Metals																
Antimony	1.8			1	1.4			1	1.2			1	1.3			1
Antimony, dissolved	1.5			1	1.4			1	1.1			1				
Arsenic	335			1	279			1	212			1	178			1
Arsenic, dissolved	315			1	282			1	214			1				
Beryllium	0.035	J		0.7	< 0.70	U		0.7	< 0.70	U		0.7	0.033	J		0.7
Beryllium, dissolved	< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7				
Cadmium	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5	0.022	J		0.5
Cadmium, dissolved	< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5				
Chromium	0.92	J		0.004	2.1	J		0.004	1.2	J		0.004	1	J		0.004
Chromium, dissolved	< 4.0	U		0.004	2.6	J		0.004	1.4	J		0.004				
Lead	< 5.0	U		0.005	< 5.0	UJ		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005	3.9	J		0.005	< 5.0	U		0.005				
Manganese	390			0.003	260			0.003	190			0.003	250			0.003
Manganese, dissolved	350			0.003	250			0.003	210			0.003				
Selenium	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015	< 15	U		0.015	< 15	U		0.015				
Silver	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003				
Thallium	0.18	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	0.11	J		0.2	< 0.20	U		0.2	< 0.20	U		0.2				
Zinc	13			0.01	3.4	J		0.01	2.9	J		0.01	13			0.01
Zinc, dissolved	< 10	U		0.01	< 10	U		0.01	< 10	U		0.01				
Semi Volatile Organic Compounds																
2-Methylphenol	< 470	U		470	56	J		500	49			4.8	21	J		95
bis(2-Ethylhexyl) phthalate	< 470	U		470	< 500	U		500	< 4.8	U		4.8	< 95	*U		95
Naphthalene	< 470	U		470	< 500	U		500	4.4	J		4.8	< 95	U		95
N-Nitrosodibutylamine	< 940	UJ		940	< 1000	U		1000	< 9.6	U		9.6	< 190	U		190
N-Nitrosopyrrolidine	< 940	UJ		940	< 1000	U		1000	< 9.6	U		9.6	< 190	U		190
o-Toluidine	< 940	UJ		940	< 1000	U		1000	< 9.6	U		9.6	< 190	U		190
Phenol	45	J		470	< 500	U		500	24			4.8	< 95	U		95
Pyridine	< 2400	U		2400	< 2500	U		2500	3.5	J		24	< 470	U		470
Volatile Organic Compounds																
1,1,1-Trichloroethane	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
1,1,2-Trichloroethane	< 4.0	U		4	< 50	U		50	1130			50	< 4.0	U		4
1,1-Dichloroethane	26			4	< 50	U		50	1170			50	2.7	J		4
1,1-Dichloroethene	< 4.0	U		4	< 50	U		50	1230			50	< 4.0	U		4
1,2-Dichloroethane	< 4.0	U		4	< 50	U		50	< 50	U		50	2.1	J		4
1,2-Dichloropropane	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
1,4-Dichlorobenzene	< 4.0	U		4	< 50	U		50	< 50	U		50	3.4	J		4
1,4-Dioxane	8.7			6.4	110			6.4	92	J		6.4	130			16
2-Butanone (MEK)	1100			40	1100			500	6320			500	490			40
Acetone	1700			40	1300			500	810			500	920			40
Acrylonitrile	< 20	U		20	< 250	U		250	< 250	U		250	< 20	U		20
Benzene	21			4	22	J		50	< 50	U		50	22			4
Carbon tetrachloride	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
Chloroform	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
cis/trans 1,2-Dichloroethene																
cis-1,2-Dichloroethene	38			8	< 100	U		100	< 100	U		100	< 8.0	U		8
Dichloromethane (Methylene chloride)	< 4.0	U		4	< 50	U		50	1230			50	< 4.0	U		4
Ethyl benzene	160			4	160			50	170			50	180			4
Ethyl methacrylate	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
n-Propylbenzene	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
Styrene	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
Tetrachloroethene	< 4.0	U		4	< 50	U		50	< 50	U		50	< 4.0	U		4
Tetrahydrofuran	640			20	480			250	370			250	380			20
Toluene	3300			50	3100			50	4140			50	4600			50
Trichloroethene	2.8	J		4	< 50	U		50	1190			50	< 4.0	U		4
Vinyl Chloride	9.9			4	< 50	U		50	1100			50	< 4.0	U		4
Xylenes (unspecified)	490			8	510			100	560			100	560			8

Parameter	MW-4S 2013-09-24 Result	LQual	VQual	RL	MW-4S 2014-05-06 Result	LQual	VQual	RL	MW-4S 2014-10-03 Result	LQual	VQual	RL	MW-4S 2015-05-07 Result	LQual	VQual	RL	MW-4S 2015-10-26 Result	LQual	VQual	RL
Field Parameters																				
Dissolved Oxygen	0.4				0.76				0.23				0.04				0.49			
Iron, Ferrous	2				4.75				3.5				3.5				2			
Oxidation Reduction Potential	-20				-110				-99				-41.6				-101.7			
pH	6.31				6.22				6.01				6.47				6.29			
Specific Conductance	2755				2431				1535				3123				2287			
Temperature	11.9				10.02				12.05				10.79				12.91			
Turbidity, field	14				12.6				14.2				12.4				16.9			
Metals																				
Antimony	0.99	J		1					1			1	1.4			1	1.5			1
Antimony, dissolved	0.96	J		1					1			1	1.4			1	1.4			1
Arsenic	125			1					105			1	107			1	96.7			1
Arsenic, dissolved	119			1					104	B		1	105			1	94.9			1
Beryllium	0.032	J		0.7					0.033	J		0.7	0.035	J		0.7	< 0.70	U		0.7
Beryllium, dissolved	< 0.70	U		0.7					< 0.70	U		0.7	< 0.70	U		0.7	< 0.70	U		0.7
Cadmium	< 0.50	U		0.5					< 0.50	U		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Cadmium, dissolved	< 0.50	U		0.5					0.09	J		0.5	< 0.50	U		0.5	< 0.50	U		0.5
Chromium	1.1	J		0.004					< 4.0	UJ		0.004	< 4.0	UJ		0.004	1.8	J		0.004
Chromium, dissolved	1.3	J		0.004					1.7	J		0.004	1.8	J		0.004	1.9	J		0.004
Lead	< 5.0	U		0.005	< 5.0	U		0.005	3.6	J		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Lead, dissolved	< 5.0	U		0.005					< 5.0	U		0.005	< 5.0	U		0.005	< 5.0	U		0.005
Manganese	260			0.003					120			0.003	590	B		0.003	140	B		0.003
Manganese, dissolved	230			0.003					110			0.003	610	B		0.003	140			0.003
Selenium	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Selenium, dissolved	< 15	U		0.015					< 15	U		0.015	< 15	U		0.015	< 15	U		0.015
Silver	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Silver, dissolved	< 3.0	U		0.003					< 3.0	U		0.003	< 3.0	U		0.003	< 3.0	U		0.003
Thallium	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Thallium, dissolved	< 0.20	U		0.2					< 0.20	U		0.2	< 0.20	U		0.2	< 0.20	U		0.2
Zinc	12			0.01					< 10	U		0.01	< 10	U		0.01	2.5	J		0.01
Zinc, dissolved	2.5	J		0.01					< 10	U		0.01	< 10	U		0.01	1.9	J		0.01
Semi Volatile Organic Compounds																				
2-Methylphenol	48	J		3.9	76	J		480	44	J		250	64			47	38			24
bis(2-Ethylhexyl) phthalate	< 3.9	UJ		3.9	< 480	U		480	< 250	U		250	< 47	U		47	< 24	UJ		24
Naphthalene	3.5	J		3.9	< 480	U		480	< 250	U		250	< 47	U		47	< 24	UJ		24
N-Nitrosodibutylamine	< 7.8	UJ		7.8	< 970	U		970	< 500	U		500	< 95	U		95	< 48	UJ		48
N-Nitrosopyrrolidine	< 7.8	UJ		7.8	< 970	U		970	< 500	U		500	< 95	U		95	< 48	UJ		48
o-Toluidine	< 7.8	UJ		7.8	< 970	U		970	< 500	U		500	< 95	U		95	< 48	UJ		48
Phenol	34			3.9	92	J		480	< 250	U		250	140			47	2.9	J		24
Pyridine	3.7	J		20	< 2400	U		2400	< 1300	U		1300	< 240	U		240	< 120	UJ		120
Volatile Organic Compounds																				
1,1,1-Trichloroethane	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,1,2-Trichloroethane	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,1-Dichloroethane	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,1-Dichloroethene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,2-Dichloroethane	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,2-Dichloropropane	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,4-Dichlorobenzene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
1,4-Dioxane	150			16	76	J		16	97			16	100			32	77			8
2-Butanone (MEK)	1400			500	2400			500	260	J		500	2200	J		500	140	J		500
Acetone	1300			500	2100			500	< 500	U		500	1500	J		500	< 500	UJ		500
Acrylonitrile	< 250	U		250	< 250	U		250	< 250	U		250	< 250	UJ		250	< 250	UJ		250
Benzene	< 50	U		50	23	J		50	23	J		50	24	J		50	21	J		50
Carbon tetrachloride	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Chloroform	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
cis/trans 1,2-Dichloroethene																				
cis-1,2-Dichloroethene	< 100	U		100	< 100	U		100	< 100	U		100	< 100	UJ		100	< 100	UJ		100
Dichloromethane (Methylene chloride)	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Ethyl benzene	150			50	180			50	190			50	210	J		50	160	J		50
Ethyl methacrylate	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
n-Propylbenzene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Styrene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Tetrachloroethene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Tetrahydrofuran	230	J		250	310			250	330			250	320	J		250	280	J		250
Toluene	3000			50	3700			50	3600			50	3600	J		50	2400	J		50
Trichloroethene	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Vinyl Chloride	< 50	U		50	< 50	U		50	< 50	U		50	< 50	UJ		50	< 50	UJ		50
Xylenes (unspecified)	480			100	570			100	640			100	700	J		100	560	J		100

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
J = Concentration is approximate (see validation narrative for rationale), estimated value provided.
U = Compound not detected above method detection limit, quantitation limit provided.
*U = Compound not detected above method detection limit, quantitation limit provided. LCS or LCSD exceeds the control limits.
UJ = The analyte was not detected above the method detection limit, approximate quantitation limit provided.
R = Result rejected due to low or no matrix spike recovery.
* = DO values less than zero are due to instrument drift near zero.
NM = Not measured due to instrument malfunction.
NS = No sample required per Environmental Monitoring Plan Table 4.1 or Field Sampling Plan Table 5.6.
NA = Data not available.
RL = Reporting Limit.
Qual = Laboratory (LQual) and/or data validation Qualifier (VQual).
Shading indicates exceedance of Groundwater Performance Standards (µg/L).
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligran
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Group SOUTHERN LANDFILL LOBE																			
		Sample ID	MW-4S				MW-4S				MW-4S				MW-4S				
		Date	2017-03-28				2017-06-28				2017-08-07				2017-10-12				
Parameter	Units	Groundwater Performance Standards (µg/L)	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	Result	LQual	VQual	RL	
Field Parameters																			
Dissolved Oxygen	mg/l	---	15.4				0.12				0.3				0.46				
Iron, Ferrous	mg/l	---	5.0				4.5				4.5				7.0				
Oxidation Reduction Potential	mV	---	-48.9				-53.8				-69.6				-84.4				
pH	SU	---	6.61				6.56				6.54				6.06				
Specific Conductance	µs/cm	---	1929				2917				2135				2948				
Temperature	CELSIUS	---	8.75				13.67				14.05				15.88				
Turbidity, field	NTU	---	84.1				18.1				43.6				33				
Metals																			
Antimony	µg/l	6																	
Antimony, dissolved	µg/l	6																	
Arsenic	µg/l	10	121			1.0	102			1.0	83.7			1.0	74.5			1.0	
Arsenic, dissolved	µg/l	10	115			1.0	84.5			2.0	79.5			1.0	76.2			1.0	
Beryllium	µg/l	4																	
Beryllium, dissolved	µg/l	4																	
Cadmium	µg/l	5																	
Cadmium, dissolved	µg/l	5																	
Chromium	µg/l	100																	
Chromium, dissolved	µg/l	100																	
Lead	µg/l	15																	
Lead, dissolved	µg/l	15																	
Manganese	µg/l	300	130			0.0030	88.3			3.0	80.3	B		3.0	73.5	B		3.0	
Manganese, dissolved	µg/l	300	120			0.0030	82.3			3.0	71.3	B		3.0	0.43	JB		3.0	
Selenium	µg/l	50																	
Selenium, dissolved	µg/l	50																	
Silver	µg/l	100																	
Silver, dissolved	µg/l	100																	
Thallium	µg/l	2																	
Thallium, dissolved	µg/l	2																	
Zinc	µg/l	2000																	
Zinc, dissolved	µg/l	2000																	
Semi Volatile Organic Compounds	**Semi Volatile Organic Co**																		
2-Methylphenol	µg/l	540													3.7	J		25	
bis(2-Ethylhexyl) phthalate	µg/l	6													< 25	U		25	
Naphthalene	µg/l	100													< 25	U		25	
N-Nitrosodibutylamine	µg/l	0.003													< 50	U		50	
N-Nitrosopyrrolidine	µg/l	0.03													< 50	U		50	
o-Toluidine	µg/l	0.2													< 50	U		50	
Phenol	µg/l	2000													< 25	U		25	
Pyridine	µg/l	9													< 130	U		130	
Volatile Organic Compounds																			
1,1,1-Trichloroethane	µg/l	200	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,1,2-Trichloroethane	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,1-Dichloroethane	µg/l	360	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,1-Dichloroethene	µg/l	7	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,2-Dichloroethane	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,2-Dichloropropane	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,4-Dichlorobenzene	µg/l	75	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
1,4-Dioxane	µg/l	4	170			13	200			13	180			13	210			16	
2-Butanone (MEK)	µg/l	4000	< 80	U		80	< 80	U	U	80	< 400	U		400	< 200	U*		200	
Acetone	µg/l	5600	50	J		80	< 80	U	U	80	< 400	U		400	< 200	U		200	
Acrylonitrile	µg/l	0.05	< 40	U		40	< 40	U	U	40	< 200	U		200	< 100	U		100	
Benzene	µg/l	5	16			8.0	16			8.0	87			40	21			20	
Carbon tetrachloride	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Chloroform	µg/l	80	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
cis/trans 1,2-Dichloroethene	µg/l	---	< 16	U		16	< 16	U	U	16	< 80	U		80	< 40	U		40	
cis-1,2-Dichloroethene	µg/l	70	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Dichloromethane (Methylene chloride)	µg/l	5	< 8.0	U		8.0	9.7			8.0	< 40	U		40	< 20	U		20	
Ethyl benzene	µg/l	700	150			8.0	140			8.0	690			40	180			20	
Ethyl methacrylate	µg/l	260	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
n-Propylbenzene	µg/l	52	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Styrene	µg/l	100	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Tetrachloroethene	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U*		20	
Tetrahydrofuran	µg/l	227	560			40	770			40	4600			200	1300			100	
Toluene	µg/l	1000	380	F1		8.0	140			8.0	270			40	55			20	
Trichloroethene	µg/l	5	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Vinyl Chloride	µg/l	2	< 8.0	U		8.0	< 8.0	U	U	8.0	< 40	U		40	< 20	U		20	
Xylenes (unspecified)	µg/l	10000	490			16	440			16	2100			80	570			40	

Notes:
"B" = compound was found in the blank and sample.
"F1" = MS and/or MSD Recovery is outside acceptance limits.
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Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.
"---" = No Groundwater Performance Standard.
deg C = Degrees in celcius
mg/L = milligrar
µg/L = micrograms per liter
mV = millivolts
NTU = Nephelometric turbidity unit
SU - Standard units of pH
us/cm = micro-siemens per centimeter

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Northern Lobe																							
				GP-3			GP-3			GP-3			GP-3			GP-3 DUP			GP-5/GP-5R			GP-5/GP-5R (Not Measured)			GP-5/GP-5R			GP-5/GP-5R		
				10/11/2017 - 10/12/2017			1/26/2018			4/26/2018			7/12/2018			7/12/2018			10/13/2017			1/26/2018			4/26/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																													
	1,1,1-Trichloroethane	µg/L	200		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,1,2-Trichloroethane	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,1-Dichloroethane	µg/L	360		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,1-Dichloroethene	µg/L	7		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,2-Dichloroethane	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,2-Dichloropropane	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,4-Dichlorobenzene	µg/L	75		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	1,4-Dioxane	µg/L	4	**80**		<16	**98**		<16	**120**		<16	**65**		<16	**160**	J	<16	**89**		<16				**73**		<16	**64**		<16
	2-Butanone (MEK)	µg/L	4000		U	<40		U	<50		UJ	<50		UJ	<50		UJ	<40		U	<40					UJ	<40		U	<40
	Acetone	µg/L	5600		U	<40		U	<50		UJ	<50		U	<50		U	<40	12	J	<40					UJ	<40		U	<40
	Acrylonitrile	µg/L	0.05		U	<20		U	<25		UJ	<25		U	<25		U	<20		U	<20					UJ	<20		U	<20
	Benzene	µg/L	5	2.8	J	<4	3.4	J	<5		UJ	<5	3.3	J	<5	3.2	J	<4	3.5	J	<4						UJ	<4	4.9		<4
	Carbon tetrachloride	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Chloroform	µg/L	80		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	cis/trans1,2-Dichloroethene	µg/L	100		U	<8		U	<10		UJ	<10		U	<10		U	<8		U	<8					UJ	<8		U	<8
	cis-1,2-Dichloroethene	µg/L	70		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Dichloromethane (Methylene chloride)	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4	**5.6**		<4
	Ethyl benzene	µg/L	700		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Ethyl methacrylate	µg/L	260		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<20		U	<25		UJ	<25		U	<25		U	<20		U	<20					UJ	<20		U	<20
	n-Propylbenzene	µg/L	52		U	<4		U	<5		UJ	<5		U	<5					U	<4					UJ	<4		U	<4
	Styrene	µg/L	100		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Tetrachloroethene	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Tetrahydrofuran	µg/L	227	57		<20	55		<25	45		<25	55		<25	59		<20	67		<20				18	J	<20	81		<20
	Toluene	µg/L	1000		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Trichloroethene	µg/L	5		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Vinyl Chloride	µg/L	2		U	<4		U	<5		UJ	<5		U	<5		U	<4		U	<4					UJ	<4		U	<4
	Xylenes (unspecified)	µg/L	10000		U	<8		U	<10		UJ	<10		U	<10		U	<8		U	<8					UJ	<8		U	<8
	Total VOCs	µg/L		139.8			156.4			165			123.3			222.2			171.5						91			155.5		
Semi Volatile Organic Compounds																													
	2-Methylphenol	µg/L	540		U	<25														U	<25									
	3/4-Methylphenol	µg/L	470		U	<50														U	<50									
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<25														U	<25									
	Naphthalene	µg/L	100		U	<25														U	<25									
	N-Nitrosodibutylamine	µg/L	0.003		U	<50														U	<50									
	N-Nitrosopyrrolidine	µg/L	0.03		U	<50														U	<50									
	o-Toluidine	µg/L	0.2		U	<50														U	<50									
	Phenol	µg/L	2000		U	<25														U	<25									
	Pyridine	µg/L	9		U	<130														U	<130									
Metals																													
	Arsenic	µg/L	10	**102**		<1	**30.7**		<1	8.5		<1	**48.2**		<2	**47.3**		<2	**260**		<1				**274**		<1	**218**		<2
	Arsenic, Dissolved	µg/L	10	**111**		<1	**28.5**		<1	**11.9**		<1	**43**		<2	**47.2**		<2	**286**		<1				**274**		<1	**232**		<2
	Manganese	µg/L	300	**1880**		<3	**1350**		<3	**740**		<3	**1400**		<3	**1390**		<3	**906**		<3				**634**		<3	**927**		<3
	Manganese, Dissolved	µg/L	300	**1940**		<3	**1240**		<3	**745**	J+	<3	**1420**		<3	**1420**		<3	**882**		<3				**564**	J+	<3	**897**		<3
Natural Attenuation Parameters																													
	Total Organic Carbon (TOC)	mg/L		43.2		<1	34.1		<1	26		<1	31.2	J+	<1	38.2		<1	39.1		<1				23.4		<1	36.3		<1
	Nitrate	mg/L		0.022	J	<0.05	0.036	J	<0.05	1.1		<0.05	0.045	J	<0.05	0.038	J	<0.05	0.061		<0.05					U	<0.05	0.043	J	<0.05
	Sulfate	mg/L		196		<75	216		<50	313		<50	183		<50	172		<50	9.5		<5				26.6		<5	16.8		<5
Field Parameters																													
	Dissolved Oxygen	mg/L		4.4			0.66			0.8			0.53						0.42						0.67			1.17		
	Iron, Ferrous	mg/L		2.5			1			0.002			0.003						1.5						0.004			0.0065		
	Oxidation Reduction Potential	mV		-86.1			-24.8			76.6			-39.6						-88.8						-64.8			-118		
	pH	SU		6.3			6.45			6.2			5.8						6.25						6.73			6.18		
	Specific Conductivity	µS/cm		2422			1511			1383			2531						1615						1166			1581		
	Temperature	°C		16.43			9.68			11.32			19.35						14.13						13.43			13.46		
	Turbidity	NTU		2.4			0.61			2.9			10.4						5.26						3.3			12		

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

"J+" = Estimated J value with a possible high bias

"J-" = Estimated J value with a possible low bias

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"UJ-" = Estimated non-detec with possible low bias

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Northern Lobe																			
				GP-7			GP-7 (Not Measured)			GP-7			GP-7			MW-2S/MW-2SR			MW-2S/MW-2SR			MW-2S/MW-2SR			MW-2S/MW-2SR		
				10/11/2017			1/26/2018			4/24/2018			7/11/2018			1011/2017 - 10/12/2017			1/26/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,1,2-Trichloroethane	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,1-Dichloroethane	µg/L	360		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,1-Dichloroethene	µg/L	7		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,2-Dichloroethane	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,2-Dichloropropane	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,4-Dichlorobenzene	µg/L	75		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	1,4-Dioxane	µg/L	4	**170**	J	<16				**170**		<32	**200**	J-	<32		U	<16		U	<6.4		UJ	<6.4		U	<6.4
	2-Butanone (MEK)	µg/L	4000		UJ	<40					UJ-	<100		UJ-	<50		U	<40		U	<20		UJ	<40		U	<40
	Acetone	µg/L	5600		UJ	<40					UJ-	<100		UJ-	<50	14	J	<40	7	J	<20		UJ	<40		U	<40
	Acrylonitrile	µg/L	0.05		UJ	<20					UJ-	<50		UJ-	<25		U	<20		U	<10		UJ	<20		U	<20
	Benzene	µg/L	5	2.7	J	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Carbon tetrachloride	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Chloroform	µg/L	80		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	cis/trans1,2-Dichloroethene	µg/L	100		UJ	<8					UJ-	<20		UJ-	<10		U	<8		U	<4		UJ	<8		U	<8
	cis-1,2-Dichloroethene	µg/L	70		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Dichloromethane (Methylene chloride)	µg/L	5	2.1	J	<4				**29**	J-	<10		UJ-	<5		U	<4		U	<2	**8.2**		<4		U	<4
	Ethyl benzene	µg/L	700		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Ethyl methacrylate	µg/L	260		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		UJ	<20					UJ-	<50		UJ-	<25		U	<20		U	<10		UJ	<20		U	<20
	n-Propylbenzene	µg/L	52		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Styrene	µg/L	100		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Tetrachloroethene	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Tetrahydrofuran	µg/L	227	63	J	<20				89	J-	<50	79	J-	<25		U	<20		U	<10		UJ	<20		U	<20
	Toluene	µg/L	1000		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Trichloroethene	µg/L	5		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Vinyl Chloride	µg/L	2		UJ	<4					UJ-	<10		UJ-	<5		U	<4		U	<2		UJ	<4		U	<4
	Xylenes (unspecified)	µg/L	10000		UJ	<8					UJ-	<20		UJ-	<10		U	<8		U	<4		UJ	<8		U	<8
	Total VOCs	µg/L		237.8						288			279			14			7			8.2			0		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540		U	<25											U	<26									
	3/4-Methylphenol	µg/L	470		U	<50											U	<51									
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<25											U	<26									
	Naphthalene	µg/L	100		U	<25											U	<26									
	N-Nitrosodibutylamine	µg/L	0.003		U	<50											U	<51									
	N-Nitrosopyrrolidine	µg/L	0.03		U	<50											U	<51									
	o-Toluidine	µg/L	0.2		U	<50											U	<51									
	Phenol	µg/L	2000		U	<25											U	<26									
	Pyridine	µg/L	9		U	<130											U	<130									
Metals																											
	Arsenic	µg/L	10	**398**		<1				**419**		<1	**349**		<2	**144**		<1	**343**		<1	**601**		<1	**484**		<2
	Arsenic, Dissolved	µg/L	10	**443**		<1				**458**		<5	**54.6**		<2	**131**		<1	**188**		<1	**211**		<1	**319**		<2
	Manganese	µg/L	300	**871**		<3				**1190**		<3	**986**		<3	**2610**		<3	**1550**		<3	**1480**		<3	**2130**		<3
	Manganese, Dissolved	µg/L	300	**931**		<3				**1210**		<3	**1020**		<3	**2490**		<3	**1390**		<3	**1470**		<3	**2020**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L		67.5		<1				76.5		<1	70.5		<1	31.8		<1	21.5		<1	21.9		<1	10.4		<1
	Nitrate	mg/L			U	<0.05					U	<0.05		U	<0.05	0.048	J	<0.05		U	<0.05		U	<0.05	0.067		<0.05
	Sulfate	mg/L		44.3	J	<50				70.6		<25	41.2		<25	270		<100	111		<25	120		<25	183		<50
Field Parameters																											
	Dissolved Oxygen	mg/L		1.49						5.9			0.47			1.34			0.04			2.67			0.92		
	Iron, Ferrous	mg/L		3.5						0.004			0.003			3			3.5			0.003			0.006		
	Oxidation Reduction Potential	mV		-94.7						-103.7			-60.7			-87.7			-257.2			-117.7			-140		
	pH	SU		6.63						6.11			5.96			6.6			6.38			6.31			6.48		
	Specific Conductivity	µS/cm		2960						2675			3756			1464			851			645			849		
	Temperature	°C		12.61						11.78			11.82			16.51			6.34			12.39			16.06		
	Turbidity	NTU		3.95						22.1			3.18			9.4			7.23			69.8			48.3		

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

"J+" = Estimated J value with a possible high bias

"J-" = Estimated J value with a possible low bias

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"UJ-" = Estimated non-detec with possible low bias

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Northern Lobe																			
				MW-7M (Not Measured)			MW-7M (Not Measured)			MW-7M (Not Measured)			MW-7M (Not Measured)			MW-7S			MW-7S			MW-7S			MW-7S		
				10/11/2017			1/26/2018			4/24/2018			7/11/2018			10/11/2017 - 10/12/2017			1/26/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200														U	<1			U	<1			UJ	<4			U	<1
	1,1,2-Trichloroethane	µg/L	5														U	<1			U	<1			UJ-	<4			U	<1
	1,1-Dichloroethane	µg/L	360													72		<1	24		<1	69		<4	76		<1
	1,1-Dichloroethene	µg/L	7													**8.7**		<1	2.5		<1	4.8		<4	**8.2**		<1
	1,2-Dichloroethane	µg/L	5													1.1		<1	0.52	J	<1	1.3	J	<4	1.2		<1
	1,2-Dichloropropane	µg/L	5														U	<1			U	<1			UJ-	<4			U	<1
	1,4-Dichlorobenzene	µg/L	75														U	<1			U	<1			UJ-	<4			U	<1
	1,4-Dioxane	µg/L	4													**54**		<6.4	**36**		<6.4	**54**		<6.4	**67**		<6.4
	2-Butanone (MEK)	µg/L	4000														U	<10			U	<10			UJ-	<40			U	<10
	Acetone	µg/L	5600														U	<10			U	<10			U	<40			U	<10
	Acrylonitrile	µg/L	0.05													**0.95**	J	<5			U	<5			UJ	<20	**1.8**	J	<5
	Benzene	µg/L	5													1.5		<1	0.5	J	<1			UJ-	<4	1.7		<1
	Carbon tetrachloride	µg/L	5														U	<1			U	<1			UJ-	<4			U	<1
	Chloroform	µg/L	80														U	<1			U	<1			UJ	<4			U	<1
	cis/trans1,2-Dichloroethene	µg/L	100													5.6		<2	1.8	J	<2	5.3	J	<8	5.5		<2
	cis-1,2-Dichloroethene	µg/L	70													5.6		<1	1.8		<1	5.3		<4	5.5		<1
	Dichloromethane (Methylene chloride)	µg/L	5													1.6		<1			U	<1			**22**		<4	1.7		<1
	Ethyl benzene	µg/L	700														U	<1			U	<1			UJ-	<4			U	<1
	Ethyl methacrylate	µg/L	260														U	<1			U	<1			UJ-	<4			U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L	800														U	<5			U	<5			UJ-	<20			U	<5
	n-Propylbenzene	µg/L	52														U	<1			U	<1			UJ-	<4			U	<1
	Styrene	µg/L	100														U	<1			U	<1			UJ-	<4			U	<1
	Tetrachloroethene	µg/L	5														U	<1			U	<1			UJ-	<4			U	<1
	Tetrahydrofuran	µg/L	227													1.9	J	<5			U	<5	37		<20	11		<5
	Toluene	µg/L	1000														U	<1			U	<1			UJ-	<4			U	<1
	Trichloroethene	µg/L	5													3.5		<1	0.9	J+	<1	2.4	J	<4	3.8		<1
	Vinyl Chloride	µg/L	2													1.3		<1			U	<1			UJ	<4	1.8		<1
	Xylenes (unspecified)	µg/L	10000														U	<2			U	<2			UJ-	<8	1	J	<2
	Total VOCs	µg/L														157.75			68.02			201.1			186.2		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540														U	<5												
	3/4-Methylphenol	µg/L	470														U	<10												
	bis(2-Ethylhexyl) phthalate	µg/L	6														U	<5												
	Naphthalene	µg/L	100														U	<5												
	N-Nitrosodibutylamine	µg/L	0.003														U	<10												
	N-Nitrosopyrrolidine	µg/L	0.03														U	<10												
	o-Toluidine	µg/L	0.2														U	<10												
	Phenol	µg/L	2000														U	<5												
	Pyridine	µg/L	9														U	<25												
Metals																											
	Arsenic	µg/L	10													**33.8**		<1	**29**		<1	**40.8**		<1	**45**		<2
	Arsenic, Dissolved	µg/L	10													**33.1**		<1	**24.6**		<1	**35.6**		<1	**47.1**		<2
	Manganese	µg/L	300													**4310**		<3	**2830**		<3	**4800**		<3	**4360**		<3
	Manganese, Dissolved	µg/L	300													**4540**		<3	**2620**		<3	**4810**		<3	**4790**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L															U	<1	7.9		<1	8.4		<1		U	<6.1
	Nitrate	mg/L														0.047	J	<0.05	0.051		<0.05	0.038	J	<0.05	0.035	J	<0.05
	Sulfate	mg/L														87.4		<50	62.1		<10	85.4		<25	63.3		<25
Field Parameters																											
	Dissolved Oxygen	mg/L														0.83			0.56			1.41			0.81		
	Iron, Ferrous	mg/L														4			2			0.0025			0.005		
	Oxidation Reduction Potential	mV														-22.3			-26.9			-89			-38.2		
	pH	SU														5.94			7.03			5.78			6.16		
	Specific Conductivity	µS/cm														785			713			581			585		
	Temperature	°C														17.44			3.98			10.28			16.42		
	Turbidity	NTU														5.7			34.3			203.6			12.82		

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QL = Quantitation Limit

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For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Northern Lobe																									
				MW-8M (Not Measured)			MW-8M			MW-8M			MW-8M			MW-9			MW-9			MW-9			MW-9 DUP			MW-9		
				10/12/2017			1/25/2018			4/24/2018			7/11/2018			10/11/2017			1/26/2018			4/24/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																													
	1,1,1-Trichloroethane	µg/L	200					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,1,2-Trichloroethane	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,1-Dichloroethane	µg/L	360					UJ-	<8		UJ	<20	4.1	J	<8		U	<200	100	J	<200		U	<1000		U	<1000		U	<1000
	1,1-Dichloroethene	µg/L	7					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,2-Dichloroethane	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,2-Dichloropropane	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,4-Dichlorobenzene	µg/L	75					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	1,4-Dioxane	µg/L	4				**120**	J-	<6.4	**130**		<32	**130**		<32	**600**		<32	**540**		<32					U	<32	**370**		<32
	2-Butanone (MEK)	µg/L	4000					UJ-	<80		UJ	<200		U	<80	**8700**		<2000	**65000**		<2000	**35000**		<10000	**45000**		<10000	**5800**	J	<10000
	Acetone	µg/L	5600					UJ-	<80		UJ	<200		U	<80	**12000**		<2000	**76000**		<10000	**47000**		<10000	**57000**		<10000	**7900**	J	<10000
	Acrylonitrile	µg/L	0.05					UJ-	<40		UJ	<100		U	<40		U	<1000		U	<1000		U	<5000		U	<5000		U	<5000
	Benzene	µg/L	5					UJ-	<8		UJ	<20	3.3	J	<8	**170**	J	<200	**190**	J	<200		U	<1000		U	<1000		U	<1000
	Carbon tetrachloride	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Chloroform	µg/L	80					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	cis/trans1,2-Dichloroethene	µg/L	100					UJ-	<16		UJ	<40			U	<16		U	<400		U	<400		U	<2000		U	<2000		U	<2000
	cis-1,2-Dichloroethene	µg/L	70					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Dichloromethane (Methylene chloride)	µg/L	5					UJ-	<8	**40**		<20			U	<8		U	<200		U	<200	**1100**		<1000	**1800**		<1000		U	<1000
	Ethyl benzene	µg/L	700					UJ-	<8		UJ	<20	30		<8	**3800**		<200	**7500**		<200	**4000**		<1000	**3900**		<1000	**3900**		<1000
	Ethyl methacrylate	µg/L	260					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Methyl Isobutyl Ketone (MIBK)	µg/L	800					UJ-	<40		UJ	<100			U	<40	**15000**		<1000	**84000**		<1000	**59000**		<5000	**65000**		<5000	**38000**		<5000
	n-Propylbenzene	µg/L	52					UJ-	<8		UJ	<20			U	<8		U	<200	**320**		<200		U	<1000		U	<1000		U	<1000
	Styrene	µg/L	100					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Tetrachloroethene	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Tetrahydrofuran	µg/L	227				62	J-	<40	110		<100	99		<40	**9100**		<1000	**9700**		<1000	**9600**		<5000	**11000**		<5000	**9000**		<5000
	Toluene	µg/L	1000					UJ-	<8		UJ	<20			U	<8	**20000**		<200	**45000**		<1000	**45000**		<1000	**45000**		<1000	**42000**		<1000
	Trichloroethene	µg/L	5					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Vinyl Chloride	µg/L	2					UJ-	<8		UJ	<20			U	<8		U	<200		U	<200		U	<1000		U	<1000		U	<1000
	Xylenes (unspecified)	µg/L	10000					UJ-	<16		UJ	<40	24		<16	**18000**		<400	**18000**		<2000	**17000**		<2000	**17000**		<2000	**17000**		<2000
	Total VOCs	µg/L					182			280			290.4			87370			306350			217700			245700			123970		
Semi Volatile Organic Compounds																													
	2-Methylphenol	µg/L	540													170		<25												
	3/4-Methylphenol	µg/L	470													150		<50												
	bis(2-Ethylhexyl) phthalate	µg/L	6														U	<25												
	Naphthalene	µg/L	100														U	<25												
	N-Nitrosodibutylamine	µg/L	0.003														U	<50												
	N-Nitrosopyrrolidine	µg/L	0.03														U	<50												
	o-Toluidine	µg/L	0.2														U	<50												
	Phenol	µg/L	2000													63		<25												
	Pyridine	µg/L	9														U	<130												
Metals																													
	Arsenic	µg/L	10				**2070**		<20	**1460**		<5	**1140**		<2	**253**		<1	**355**		<1	**322**	J+	<1	**328**		<1	**284**		<2
	Arsenic, Dissolved	µg/L	10				**849**		<1	**899**		<1	**770**		<2	**310**		<1	**324**		<1	**375**	J-	<1	**360**		<1	**290**		<2
	Manganese	µg/L	300				**779**		<3	**658**		<3	**698**		<3	**5680**		<3	**12200**		<3	**10500**	J+	<3	**10800**		<3	**8880**		<3
	Manganese, Dissolved	µg/L	300				**726**		<3	**642**		<3	**763**		<3	**7310**		<3	**11700**		<3	**9720**	J+	<3	**10000**		<3	**9400**		<3
Natural Attenuation Parameters																													
	Total Organic Carbon (TOC)	mg/L					49.8		<1	56.8		<1	53.5		<1	91		<1	270		<4	250		<4	211		<4	119		<2
	Nitrate	mg/L						U	<0.05		UJ	<0.05		U	<0.05		U	<0.05		UJ	<0.05		UJ	<0.05		UJ	<0.05		U	<0.05
	Sulfate	mg/L					34.2		<5	32.4		<5	25.5		<5	16.8		<5		U	<5		U	<5		U	<5	18.2		<5
Field Parameters																													
	Dissolved Oxygen	mg/L					0.97			0.55			0.51			1.58			0.71			1.47						0.44		
	Iron, Ferrous	mg/L					1.5			0.004			0.003			7			2			0.0035						0.0045		
	Oxidation Reduction Potential	mV					-41.6			-121.8			-61.5			-102.6			-44.3			-109.2						-71.9		
	pH	SU					6.67			6.62			6.27			6.5			6.42			6.07						5.86		
	Specific Conductivity	µS/cm					2.884			2654			3143			1339			1079			907						1371		
	Temperature	°C					6.56			10.81			14.86			13.42			7.22			11.09						15.25		
	Turbidity	NTU					-41.6			25.3			7.82			5.75			8.99			5.9						16.3		

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

"J+" = Estimated J value with a possible high bias

"J-" = Estimated J value with a possible low bias

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"UJ-" = Estimated non-detec with possible low bias

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Southern Lobe																			
				GP-16			GP-16			GP-16			GP-16			GP-18			GP-18			GP-18		
				10/12/2017			1/25/2018			4/25/2018			7/12/2018			10/13/2017			1/26/2018			4/25/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,1,2-Trichloroethane	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,1-Dichloroethane	µg/L	360	12	J	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,1-Dichloroethene	µg/L	7		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,2-Dichloroethane	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4	0.29	J	<1		UJ-	<1		UJ-	<2
	1,2-Dichloropropane	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,4-Dichlorobenzene	µg/L	75	45		<20	56		<50		UJ-	<50	45		<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	1,4-Dioxane	µg/L	4		U	<16	**43**		<16	**18**	J-	<16	**30**		<16	**37**		<16		U	<16		UJ-	<16	**10**	J-	<16
	2-Butanone (MEK)	µg/L	4000	270		<200	280	J	<500	170	J-	<500	160	J	<200		U	<40		U	<10		UJ-	<10		UJ-	<20
	Acetone	µg/L	5600	440		<200	410	J	<500	400	J-	<500	230		<200		U	<40		U	<10		UJ-	<10		UJ-	<20
	Acrylonitrile	µg/L	0.05		U	<100		U	<250		UJ-	<250		U	<100		U	<20		U	<5		UJ-	<5		UJ-	<10
	Benzene	µg/L	5	**14**	J	<20		U	<50		UJ-	<50	**14**	J	<20	**5.6**		<4	0.76	J	<1		UJ-	<1	1.4	J-	<2
	Carbon tetrachloride	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Chloroform	µg/L	80		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	cis/trans1,2-Dichloroethene	µg/L	100	80		<40	81	J	<100	49	J-	<100	38	J	<40		U	<8	1.1	J	<2		UJ-	<2		UJ-	<4
	cis-1,2-Dichloroethene	µg/L	70	**80**		<20	**81**		<50	49	J-	<50	38		<20		U	<4	1.1		<1		UJ-	<1		UJ-	<2
	Dichloromethane (Methylene chloride)	µg/L	5		U	<20		U	<50		UJ-	<50	**24**		<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Ethyl benzene	µg/L	700	190		<20	220		<50	150	J-	<50	180		<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Ethyl methacrylate	µg/L	260		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Methyl Isobutyl Ketone (MIBK)	µg/L	800	420		<100	480		<250	230	J-	<250	310		<100		U	<20		U	<5		UJ-	<5		UJ-	<10
	n-Propylbenzene	µg/L	52		U	<20		U	<50		UJ-	<50		U	<20	9.7		<4	1.9		<1		UJ-	<1	2	J-	<2
	Styrene	µg/L	100		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Tetrachloroethene	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Tetrahydrofuran	µg/L	227	140		<100	130	J	<250		UJ-	<250	170		<100	**250**		<20	33		<5	7.7	J-	<5	58	J-	<10
	Toluene	µg/L	1000	**2200**		<50	**2200**		<50	**1800**	J-	<50	**1300**		<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Trichloroethene	µg/L	5		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Vinyl Chloride	µg/L	2		U	<20		U	<50		UJ-	<50		U	<20		U	<4		U	<1		UJ-	<1		UJ-	<2
	Xylenes (unspecified)	µg/L	10000	750		<40	850		<100	590	J-	<100	770		<40	110		<8	7.8		<2	1.1	J-	<2	12	J-	<4
	Total VOCs	µg/L		4641			4831			3456			3309			412.3			45.95			8.8			83.4		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540	26		<25											U	<25									
	3/4-Methylphenol	µg/L	470	390		<200											U	<50									
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<25											U	<25									
	Naphthalene	µg/L	100	5.6	J	<25											U	<25									
	N-Nitrosodibutylamine	µg/L	0.003		U	<50											U	<50									
	N-Nitrosopyrrolidine	µg/L	0.03		U	<50											U	<50									
	o-Toluidine	µg/L	0.2		U	<50											U	<50									
	Phenol	µg/L	2000	270		<25											U	<25									
	Pyridine	µg/L	9		U	<130											U	<130									
Metals																											
	Arsenic	µg/L	10	**779**		<10	**574**		<1	**472**		<1	**628**		<2	**562**		<1	**546**		<1	**607**		<1	**492**		<2
	Arsenic, Dissolved	µg/L	10	**566**		<1	**595**		<1	**401**		<1	**652**		<2	**603**		<1	**561**		<1	**635**		<1	**445**		<2
	Manganese	µg/L	300	**1030**		<3	**735**		<3	**860**		<3	**667**		<3	**375**		<3	**370**		<3	**533**		<3	**539**		<3
	Manganese, Dissolved	µg/L	300	**690**		<3	**769**		<3	**756**		<3	**640**		<3	**339**		<3	**345**		<3	**513**		<3	**536**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L		217		<4	195		<4	168		<4	119		<2	26.5		<1	14.7		<1	16.2		<1	15.1		<1
	Nitrate	mg/L			U	<0.05		UJ	<0.05	0.032	J	<0.05		UJ	<0.05	0.026	J	<0.05	0.02	J	<0.05		U	<0.05		UJ	<0.05
	Sulfate	mg/L			U	<5		U	<5		U	<5		U	<5		U	<5		U	<5		U	<5		U	<100
Field Parameters																											
	Dissolved Oxygen	mg/L		0.48			0.58			0.54			0.53			0.27			0.33			0.57			0.24		
	Iron, Ferrous	mg/L		7			2			0.005			0.003			2.5			3			0.005			0.0055		
	Oxidation Reduction Potential	mV		-67.4			-72.2			-91.6			-40.5			-86.3			-52.2			-114.7			-63.9		
	pH	SU		5.99			6.18			6.37			5.66			6.56			6.68			6.74			6.58		
	Specific Conductivity	µS/cm		1077			791			747			1092			849			458			383			566		
	Temperature	°C		12.64			6.64			9.4			14.85			11.46			8.9			4.85			12.5		
	Turbidity	NTU		36.7			27.2			31.8			18.2			3.14			3.05			2.6			2.58		

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Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Southern Lobe																							
				GP-21			GP-21			GP-21			GP-21			MW-4B			MW-4B DUP			MW-4B			MW-4B			MW-4B		
				10/13/2017			1/25/2018			4/25/2018			7/12/2018			10/12/2017			10/12/2017			1/25/2018			4/25/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																													
	1,1,1-Trichloroethane	µg/L	200		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,1,2-Trichloroethane	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,1-Dichloroethane	µg/L	360		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,1-Dichloroethene	µg/L	7		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,2-Dichloroethane	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,2-Dichloropropane	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,4-Dichlorobenzene	µg/L	75		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	1,4-Dioxane	µg/L	4	**45**		<16	**50**		<16	**28**		<16	**35**	J-	<16	**1000**		<40	**950**		<40	**860**		<40	**1000**	J-	<40	**780**	J-	<40
	2-Butanone (MEK)	µg/L	4000		U	<50		U	<50		U	<50		UJ-	<50		U	<1000		U	<1000		U	<1000		UJ-	<1000		UJ-	<1000
	Acetone	µg/L	5600		U	<50		U	<50		U	<50		UJ-	<50		U	<1000		U	<1000		U	<1000		UJ-	<1000		UJ-	<1000
	Acrylonitrile	µg/L	0.05		U	<25		U	<25		U	<25		UJ-	<25		U	<500		U	<500		U	<500		UJ-	<500		UJ-	<500
	Benzene	µg/L	5	4.3	J	<5	**5.5**		<5	3.2	J	<5	4.1	J-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Carbon tetrachloride	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Chloroform	µg/L	80		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	cis/trans1,2-Dichloroethene	µg/L	100		U	<10		U	<10		U	<10		UJ-	<10		UR	<200		U	<200		U	<200		UJ-	<200		UJ-	<200
	cis-1,2-Dichloroethene	µg/L	70		U	<5		U	<5		U	<5		UJ-	<5		UR	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Dichloromethane (Methylene chloride)	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		UR	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Ethyl benzene	µg/L	700		U	<5		U	<5		U	<5		UJ-	<5		U	<100				190		<100	230	J-	<100	280	J-	<100
	Ethyl methacrylate	µg/L	260		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<25		U	<25		U	<25		UJ-	<25		U	<500		U	<500		U	<500		UJ-	<500		UJ-	<500
	n-Propylbenzene	µg/L	52	6.4		<5	9.5		<5	5.5		<5	7.5	J-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Styrene	µg/L	100		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Tetrachloroethene	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		UR	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Tetrahydrofuran	µg/L	227	210		<25	**340**		<25	170		<25	**260**	J-	<25		UJ	<500				**8200**		<500	**9000**	J-	<500	**7900**	J-	<500
	Toluene	µg/L	1000		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Trichloroethene	µg/L	5		U	<5		U	<5		U	<5		UJ-	<5		UR	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Vinyl Chloride	µg/L	2		U	<5		U	<5		U	<5		UJ-	<5		U	<100		U	<100		U	<100		UJ-	<100		UJ-	<100
	Xylenes (unspecified)	µg/L	10000	62		<10	130		<10	80		<10	100	J-	<10		U	<200				590		<200	800	J-	<200	640	J-	<200
	Total VOCs	µg/L		327.7			535			286.7			406.6			1000			950			9840			11030			9600		
Semi Volatile Organic Compounds																													
	2-Methylphenol	µg/L	540		U	<25											U	<25		U	<25									
	3/4-Methylphenol	µg/L	470		U	<50											U	<50		U	<50									
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<25											U	<25		U	<25									
	Naphthalene	µg/L	100		U	<25											U	<25		U	<25									
	N-Nitrosodibutylamine	µg/L	0.003		U	<50											U	<50		U	<50									
	N-Nitrosopyrrolidine	µg/L	0.03		U	<50											U	<50		U	<50									
	o-Toluidine	µg/L	0.2		U	<50										**8.6**	J	<50	**8.7**	J	<50									
	Phenol	µg/L	2000		U	<25											U	<25		U	<25									
	Pyridine	µg/L	9		U	<130											U	<130		U	<130									
Metals																													
	Arsenic	µg/L	10	**210**		<1	**289**		<1	**275**		<1	**302**		<2	**1330**		<10	**1430**		<100	**2120**		<20	**2370**		<5	**1180**		<2
	Arsenic, Dissolved	µg/L	10	**243**		<1	**308**		<1	**300**		<1	**263**		<2	**1130**		<100	**1360**		<100	**2110**		<20	**2700**		<5	**1180**		<2
	Manganese	µg/L	300	**642**		<3	**681**		<3	**512**		<3	**510**		<3	74.5		<3	73.7		<3	133		<3	129		<3	135		<3
	Manganese, Dissolved	µg/L	300	**544**		<3	**660**		<3	**489**		<3	**547**		<3	81.7		<3	76		<3	128		<3	102		<3	131		<3
Natural Attenuation Parameters																													
	Total Organic Carbon (TOC)	mg/L			U	<1	23.2		<1	19.3		<1	18.1		<1	92.3		<1	93.1		<1	89		<1	95.8		<1	75.5		<1
	Nitrate	mg/L		0.025	J	<0.05	0.051		<0.05		U	<0.05	0.057	J	<0.05	0.038	J	<0.05	0.021	J	<0.05	0.023	J	<0.05		U	<0.05	0.046	J	<0.05
	Sulfate	mg/L			U	<5	2	J	<5		U	<5		U	<5		UJ	<5		U	<5		U	<5		U	<5		U	<5
Field Parameters																													
	Dissolved Oxygen	mg/L		0.3			0.02			0.65			0.35			0.31						0.07			0.52			0.35		
	Iron, Ferrous	mg/L		2			1.5			0.0045			0.003			7						0.5			0.005			0.0035		
	Oxidation Reduction Potential	mV		-53.1			-282.9			-109.3			-49.2			-101.4						-216.9			-123.1			-70.9		
	pH	SU		6.3			6.44			6.61			6.42			6.33						6.39			6.61			6.37		
	Specific Conductivity	µS/cm		654			950			732			982			3.58						2442			2637			2883		
	Temperature	℃		10.21			7.16			9.84			12.05			14.5						7.67			10.21			13.81		
	Turbidity	NTU		3.09			13.5			15.3			10.3			9.81						26			6.4			29.5		

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

"J+" = Estimated J value with a possible high bias

"J-" = Estimated J value with a possible low bias

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"UJ-" = Estimated non-detec with possible low bias

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Southern Lobe																							
				MW-4S			MW-4S			MW-4S DUP			MW-4S			MW-4S			MW-110			MW-110 (Not Measured)			MW-110			MW-110		
				10/12/2017			1/25/2018			1/25/2018			4/25/2018			7/12/2018			10/12/2017			1/26/2018			4/26/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																													
	1,1,1-Trichloroethane	µg/L	200		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,1,2-Trichloroethane	µg/L	5		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,1-Dichloroethane	µg/L	360		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,1-Dichloroethene	µg/L	7		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,2-Dichloroethane	µg/L	5		U	<20		U	<20	2.6	JR	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,2-Dichloropropane	µg/L	5		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,4-Dichlorobenzene	µg/L	75		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	1,4-Dioxane	µg/L	4	**210**		<16	**180**		<13	**140**		<13	**140**	J-	<16	**130**		<16	**590**		<16				**480**	J-	<16	**420**		<16
	2-Butanone (MEK)	µg/L	4000		*U	<200		U	<200	32	JR	<100		UJ-	<200		UJ	<200		U	<200					UJ-	<200		UJ	<200
	Acetone	µg/L	5600		U	<200		U	<200					UJ-	<200		U	<200		U	<200					UJ-	<200		U	<200
	Acrylonitrile	µg/L	0.05		U	<100		U	<100		U	<50		UJ-	<100		U	<100		U	<100					UJ-	<100		U	<100
	Benzene	µg/L	5	**21**		<20	**22**		<20	**23**		<10	**20**	J-	<20	**19**	J	<20	**9**	J	<20					UJ-	<20	**9.2**	J	<20
	Carbon tetrachloride	µg/L	5		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Chloroform	µg/L	80		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	cis/trans1,2-Dichloroethene	µg/L	100		U	<40		U	<40		U	<20		UJ-	<40		U	<40		U	<40					UJ-	<40		U	<40
	cis-1,2-Dichloroethene	µg/L	70		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Dichloromethane (Methylene chloride)	µg/L	5		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Ethyl benzene	µg/L	700	180		<20	180		<20	190		<10	120	J-	<20	160		<20	91		<20					UJ-	<20	60		<20
	Ethyl methacrylate	µg/L	260		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<100	120	J	<100	730	J	<50		UJ-	<100		U	<100		U	<100					UJ-	<100		U	<100
	n-Propylbenzene	µg/L	52		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Styrene	µg/L	100		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Tetrachloroethene	µg/L	5		*U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Tetrahydrofuran	µg/L	227	**1300**		<100	**760**		<100	**640**		<50	**740**	J-	<100	**720**		<100	**3800**		<100				**3400**	J-	<100	**3700**		<100
	Toluene	µg/L	1000	55		<20	200	J+	<20	750	J+	<10		UJ-	<20		UJ	<20	18	J	<20					UJ-	<20		U	<20
	Trichloroethene	µg/L	5		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Vinyl Chloride	µg/L	2		U	<20		U	<20		U	<10		UJ-	<20		U	<20		U	<20					UJ-	<20		U	<20
	Xylenes (unspecified)	µg/L	10000	570		<40	590		<40	650		<20	490	J-	<40	560		<40	300		<40				46	J-	<40	130		<40
	Total VOCs	µg/L		2336			2052			3157.6			1510			1589			4808						3926			4319.2		
Semi Volatile Organic Compounds																													
	2-Methylphenol	µg/L	540	3.7	J	<25														U	<27									
	3/4-Methylphenol	µg/L	470	21	J	<50														U	<53									
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<25														U	<27									
	Naphthalene	µg/L	100		U	<25														U	<27									
	N-Nitrosodibutylamine	µg/L	0.003		U	<50														U	<53									
	N-Nitrosopyrrolidine	µg/L	0.03		U	<50														U	<53									
	o-Toluidine	µg/L	0.2		U	<50														U	<53									
	Phenol	µg/L	2000		U	<25														U	<27									
	Pyridine	µg/L	9		U	<130														U	<130									
Metals																													
	Arsenic	µg/L	10	74.5		<1	**77.5**		<1				**86.5**		<1	**66.4**		<2	**88.1**		<1				**106**		<1	**92.3**		<2
	Arsenic, Dissolved	µg/L	10	76.2		<1							**80**		<1	**25.2**		<2	**85.8**		<1				**48.8**		<1	**31.2**		<2
	Manganese	µg/L	300	73.5		<3	96.5		<3	124		<3	145		<3	116		<3	**1520**		<3				**1700**		<3	**505**		<3
	Manganese, Dissolved	µg/L	300	0.43	JB	<3	104		<3	98.5		<3	139		<3	111		<3	226		<3				**372**	J+	<3	140		<3
Natural Attenuation Parameters																													
	Total Organic Carbon (TOC)	mg/L		72.7		<1	71	J+	<1	75.7	J+	<1	64.3		<1	56.6		<1	145		<2				109		<2	114		<2
	Nitrate	mg/L			U	<0.05	0.027	J	<0.05	0.027	J	<0.05		U	<0.05		U	<0.05	0.11		<0.05					U	<0.05	0.02	J	<0.05
	Sulfate	mg/L			U	<5	5	J+	<5		U	<5		U	<5		U	<5		U	<5					U	<5		U	<5
Field Parameters																													
	Dissolved Oxygen	mg/L		0.46			0.06						0.61			0.45			7.2			0.61			0.33			0.57		
	Iron, Ferrous	mg/L		7			1						0.004			0.0025			4.5			1			0.002			0.003		
	Oxidation Reduction Potential	mV		-84.4			-100.2						-111			-45.7			-105.4			-126.2			-104.7			-75.5		
	pH	SU		6.06			6.62						6.56			6.16			6.74			7.14			7.23			5.69		
	Specific Conductivity	µS/cm		2948			2748						2254			2621			3040			1564			2717			2900		
	Temperature	°C		15.88			8.72						9.7			14.59			15.48			6.51			10.5			17.23		
	Turbidity	NTU		33			15.8						8.3			9.78			300.1			10.3			1152.3			1216.7		

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For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																							
				GP-24			GP-24			GP-24			GP-24			GP-25 (Not Measured)			GP-25			GP-25			GP-25		
				10/11/2017			1/25/2018			4/24/2018			7/11/2018 - 7/12/2018			10/11/2017			1/25/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,1,2-Trichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,1-Dichloroethane	µg/L	360		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,1-Dichloroethene	µg/L	7		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,2-Dichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,2-Dichloropropane	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,4-Dichlorobenzene	µg/L	75		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	1,4-Dioxane	µg/L	4	1.7		<1.6	3.7		<1.6	2.1		<1.6	2.4		<1.6				**160**		<16	**140**	J-	<32	**70**	J-	<32
	2-Butanone (MEK)	µg/L	4000		U	<10		U	<10		U	<10		U	<10					U	<100		UJ-	<100		UJ-	<50
	Acetone	µg/L	5600		U	<10		U	<10		U	<10		U	<10					U	<100		UJ-	<100	16	J-	<50
	Acrylonitrile	µg/L	0.05		U	<5		U	<5		U	<5		U	<5					U	<50		UJ-	<50		UJ-	<25
	Benzene	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10	2.4	J-	<5
	Carbon tetrachloride	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Chloroform	µg/L	80		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	cis/trans1,2-Dichloroethene	µg/L	100		U	<2		U	<2		U	<2		U	<2					U	<20		UJ-	<20		UJ-	<10
	cis-1,2-Dichloroethene	µg/L	70		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Dichloromethane (Methylene chloride)	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10	**13**	J-	<10		UJ-	<5
	Ethyl benzene	µg/L	700		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Ethyl methacrylate	µg/L	260		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<5		U	<5		U	<5		U	<5					U	<50		UJ-	<50		UJ-	<25
	n-Propylbenzene	µg/L	52		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Styrene	µg/L	100		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Tetrachloroethene	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Tetrahydrofuran	µg/L	227		U	<5		U	<5		U	<5		U	<5				89		<50	110	J-	<50	62	J-	<25
	Toluene	µg/L	1000		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Trichloroethene	µg/L	5		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Vinyl Chloride	µg/L	2		U	<1		U	<1		U	<1		U	<1					U	<10		UJ-	<10		UJ-	<5
	Xylenes (unspecified)	µg/L	10000		U	<2		U	<2		U	<2		U	<2					U	<20		UJ-	<20		UJ-	<10
	Total VOCs	µg/L		1.7			3.7			2.1			2.4						249			263			150.4		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540		U	<5																					
	3/4-Methylphenol	µg/L	470		U	<10																					
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<5																					
	Naphthalene	µg/L	100		U	<5																					
	N-Nitrosodibutylamine	µg/L	0.003		U	<10																					
	N-Nitrosopyrrolidine	µg/L	0.03		U	<10																					
	o-Toluidine	µg/L	0.2		U	<10																					
	Phenol	µg/L	2000		U	<5																					
	Pyridine	µg/L	9		U	<25																					
Metals																											
	Arsenic	µg/L	10	8.6		<1	9.3		<1	9.4		<1	9		<2				**1160**		<20	**1150**		<5	**1210**		<2
	Arsenic, Dissolved	µg/L	10	8.4		<1	9.3		<1	9.1		<1	8.7		<2				**1250**		<20	**991**		<5	**1220**		<2
	Manganese	µg/L	300	**606**		<3	**618**		<3	**711**		<3	**697**		<3				**4250**		<3	**4830**		<3	**4330**		<3
	Manganese, Dissolved	µg/L	300	**614**		<3	**624**		<3	**703**		<3	**698**		<3				**3950**		<3	**4840**		<3	**4210**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L			U	<1		U	<4.9		U	<2.4		U	<1				73.7		<1	76.8		<1	38.6		<1
	Nitrate	mg/L			U	<0.05		U	<0.05		UJ	<0.05		UJ	<0.05					U	<0.05		UJ	<0.05		UJ	<0.05
	Sulfate	mg/L		5.6		<5	8.4		<5	9.3		<5	11.2		<5					U	<5		U	<5	24.5		<5
Field Parameters																											
	Dissolved Oxygen	mg/L		0.4			0.38			0.52			0.78			0.78			1.17			1.86			0.86		
	Iron, Ferrous	mg/L		3			1.5			0.0035			0.004			0.004			0.5			0.003			0.004		
	Oxidation Reduction Potential	mV		-86.8			-27			-62.3			-124.7			-124.7			-85.1			-121.4			-166.2		
	pH	SU		6.78			6.76			6.69			6.86			6.86			6.82			6.4			6.83		
	Specific Conductivity	µS/cm		389			416			340			326			326			3568			2806			2296		
	Temperature	°C		12.69			8.3			11.44			12.07			12.07			7.2			11.38			12.72		
	Turbidity	NTU		1.19			6.32			6.9			2.52			2.52			2.04			9.9			3.42		

Notes:

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"J+" = Estimated J value with a possible high bias

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QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				GP-8			GP-8			GP-8			GP-8			MW-10 (Not Measured)			MW-10			MW-10		
				10/11/2017			1/25/2018			4/25/2018			7/12/2018			10/11/2017			1/25/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																										
	1,1,1-Trichloroethane	µg/L	200		U	<1		U	<1		U	<1		U	<1				1.2	J-	<1	0.86	J	<1		U	<1
	1,1,2-Trichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	1,1-Dichloroethane	µg/L	360		U	<1		U	<1		U	<1		U	<1				4.4	J-	<1	3.4		<1	5.1		<1
	1,1-Dichloroethene	µg/L	7		U	<1		U	<1		U	<1		U	<1				6.5	J-	<1	5.2		<1	4.7		<1
	1,2-Dichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L	75		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	1,4-Dioxane	µg/L	4		U	<1.6	0.72	J	<1.6		U	<1.6		U	<1.6				**5.5**	J-	<1.6	**6.5**		<1.6	3.9		<1.6
	2-Butanone (MEK)	µg/L	4000		U	<10		U	<10		U	<10		U	<10					UJ-	<10		U	<10		U	<10
	Acetone	µg/L	5600		U	<10		U	<10		U	<10		U	<10					UJ-	<10		U	<10		U	<10
	Acrylonitrile	µg/L	0.05		U	<5		U	<5		U	<5		U	<5					UJ-	<5		U	<5		U	<5
	Benzene	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Chloroform	µg/L	80		U	<1		U	<1		U	<1	1.6		<1					UJ-	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L	100		U	<2		U	<2		U	<2		U	<2					UJ-	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L	70		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L	5		UJ-	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Ethyl benzene	µg/L	700		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Ethyl methacrylate	µg/L	260		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<5		U	<5		U	<5		U	<5					UJ-	<5		U	<5		U	<5
	n-Propylbenzene	µg/L	52		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Styrene	µg/L	100		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Tetrachloroethene	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L	227		U	<5		U	<5		U	<5		U	<5					UJ-	<5		U	<5		U	<5
	Toluene	µg/L	1000		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Trichloroethene	µg/L	5		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Vinyl Chloride	µg/L	2		U	<1		U	<1		U	<1		U	<1					UJ-	<1		U	<1		U	<1
	Xylenes (unspecified)	µg/L	10000		U	<2		U	<2		U	<2		U	<2					UJ-	<2		U	<2		U	<2
	Total VOCs	µg/L		0			0.72			0			1.6						17.6			15.96			13.7		
Semi Volatile Organic Compounds																										
	2-Methylphenol	µg/L	540		U	<5																				
	3/4-Methylphenol	µg/L	470		U	<10																				
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<5																				
	Naphthalene	µg/L	100		U	<5																				
	N-Nitrosodibutylamine	µg/L	0.003		U	<10																				
	N-Nitrosopyrrolidine	µg/L	0.03		U	<10																				
	o-Toluidine	µg/L	0.2		U	<10																				
	Phenol	µg/L	2000		U	<5																				
	Pyridine	µg/L	9		U	<25																				
Metals																										
	Arsenic	µg/L	10	0.41	J	<1	0.4	J	<1		U	<1		U	<2				**83.4**	J-	<1	**24**		<1	**79.6**		<2
	Arsenic, Dissolved	µg/L	10	0.37	J	<1	0.4	J	<1		U	<1		U	<2				**15.7**		<1	5		<1	**33.3**		<2
	Manganese	µg/L	300	**681**		<3	**623**		<3	**415**		<3	**399**		<3				**4050**		<3	**5050**		<3	**3890**		<3
	Manganese, Dissolved	µg/L	300	**616**		<3	**488**		<3	**393**		<3	**382**		<3				**4030**		<3	**5120**		<3	**3880**		<3
Natural Attenuation Parameters																										
	Total Organic Carbon (TOC)	mg/L			U	<1		U	<4.9		U	<1.7		U	<1					U	<4.9	4.1		<1		U	<1
	Nitrate	mg/L			U	<0.05		U	<0.05	0.38		<0.05	2.2	J	<0.05				0.023	J	<0.05		U	<0.05		U	<0.05
	Sulfate	mg/L		42.5		<25	41.6	J-	<10	52.6		<10	39.5		<10				11.6		<5	17.2		<5	11.5		<5
Field Parameters																										
	Dissolved Oxygen	mg/L		0.42			1.08			0.33			1.22						0.4			0.55			0.34		
	Iron, Ferrous	mg/L		0			0			0.0005									0			0			0.0045		
	Oxidation Reduction Potential	mV		90			129.3			130.3			38.1						26.4			233.1			26.6		
	pH	SU		6.13			6.2			6.38			6.2						7			6.28			6.27		
	Specific Conductivity	µS/cm		421			373			433			388						455			481			434		
	Temperature	°C		13.3			6.54			10.75			13						5.64			12.03			13.72		
	Turbidity	NTU		3.32			1.54			0.4			2.12						148.1			56.4			45.6		

Notes:

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For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				MW-11 (Not Measured)			MW-11 (Not Measured)			MW-11			MW-11			MW-11D (Not Measured)			MW-11D (Not Measured)			MW-11D			MW-11D		
				10/11/2017			1/25/2018			4/24/2018			7/11/2018			10/11/2017			1/25/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200								UJ	<20		U	<20								UJ	<4		U	<1
	1,1,2-Trichloroethane	µg/L	5								UJ	<20		U	<20								UJ	<4		U	<1
	1,1-Dichloroethane	µg/L	360								UJ	<20		U	<20								UJ	<4		U	<1
	1,1-Dichloroethene	µg/L	7								UJ	<20		U	<20								UJ	<4		U	<1
	1,2-Dichloroethane	µg/L	5								UJ	<20		U	<20								UJ	<4	0.32	J	<1
	1,2-Dichloropropane	µg/L	5								UJ	<20		U	<20								UJ	<4		U	<1
	1,4-Dichlorobenzene	µg/L	75								UJ	<20		U	<20								UJ	<4		U	<1
	1,4-Dioxane	µg/L	4								UJ	<16	**150**		<16							**100**		<16	**77**		<16
	2-Butanone (MEK)	µg/L	4000								UJ	<200		U	<200								UJ	<40		U	<10
	Acetone	µg/L	5600								UJ	<200		U	<200								U	<40		U	<10
	Acrylonitrile	µg/L	0.05								UJ	<100		U	<100								UJ	<20		U	<5
	Benzene	µg/L	5							**20**		<20	**22**		<20								UJ	<4	1.2		<1
	Carbon tetrachloride	µg/L	5								UJ	<20		U	<20								UJ	<4		U	<1
	Chloroform	µg/L	80								UJ	<20		U	<20								UJ	<4		U	<1
	cis/trans1,2-Dichloroethene	µg/L	100								UJ	<40		U	<40								UJ	<8		U	<2
	cis-1,2-Dichloroethene	µg/L	70								UJ	<20		U	<20								UJ	<4		U	<1
	Dichloromethane (Methylene chloride)	µg/L	5							**38**		<20		U	<20								UJ	<4		U	<1
	Ethyl benzene	µg/L	700								UJ	<20		U	<20								UJ	<4		U	<1
	Ethyl methacrylate	µg/L	260								UJ	<20		U	<20								UJ	<4		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L	800								UJ	<100		U	<100								UJ	<20		U	<5
	n-Propylbenzene	µg/L	52							20		<20	30		<20								UJ	<4		U	<1
	Styrene	µg/L	100								UJ	<20		U	<20								UJ	<4		U	<1
	Tetrachloroethene	µg/L	5								UJ	<20		U	<20								UJ	<4		U	<1
	Tetrahydrofuran	µg/L	227							**1800**		<100	**1500**		<100								UJ	<20	7.3		<5
	Toluene	µg/L	1000								UJ	<20		U	<20								UJ	<4		U	<1
	Trichloroethene	µg/L	5								UJ	<20		U	<20								UJ	<4		U	<1
	Vinyl Chloride	µg/L	2								UJ	<20		U	<20								UJ	<4		U	<1
	Xylenes (unspecified)	µg/L	10000							220		<40	200		<40								UJ	<8		U	<2
	Total VOCs	µg/L								2098			1902									100			85.82		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540																								
	3/4-Methylphenol	µg/L	470																								
	bis(2-Ethylhexyl) phthalate	µg/L	6																								
	Naphthalene	µg/L	100																								
	N-Nitrosodibutylamine	µg/L	0.003																								
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	o-Toluidine	µg/L	0.2																								
	Phenol	µg/L	2000																								
	Pyridine	µg/L	9																								
Metals																											
	Arsenic	µg/L	10							**2170**		<5	**1830**		<2							**73.4**		<1	**48**		<2
	Arsenic, Dissolved	µg/L	10							**2160**		<5	**1800**		<2							**51**		<1	**49.3**		<2
	Manganese	µg/L	300							189		<3	233		<3							**1540**		<3	**1220**		<3
	Manganese, Dissolved	µg/L	300							194		<3	214		<3							**1550**		<3	**1320**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L								39.8		<1	40.9		<1							11.7		<1		U	<1
	Nitrate	mg/L								0.028	J	<0.05		UJ	<0.05								UJ	<0.05		UJ	<0.05
	Sulfate	mg/L									U	<5		U	<5							2.6	J	<5	2.9	J	<5
Field Parameters																											
	Dissolved Oxygen	mg/L								0.53			0.79									0.52			0.47		
	Iron, Ferrous	mg/L								0.004			0.0035									0.003			0.0025		
	Oxidation Reduction Potential	mV								-104.6			-68.1									-118			-43.4		
	pH	SU								6.11			6.32									6.81			6.23		
	Specific Conductivity	µS/cm								1504			1832									727			693		
	Temperature	°C								14.9			16.94									11.54			14.06		
	Turbidity	NTU								6.6			80.5									18.8			2.04		

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Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				MW-11S (Not Measured)			MW-11S (Not Measured)			MW-11S			MW-11S			MW-13D			MW-13D			MW-13D			MW-13D		
				10/11/2017			1/25/2018			4/24/2018			7/11/2018			10/11/2017			1/25/2018			4/25/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,1,2-Trichloroethane	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,1-Dichloroethane	µg/L	360								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,1-Dichloroethene	µg/L	7								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,2-Dichloroethane	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,2-Dichloropropane	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,4-Dichlorobenzene	µg/L	75								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	1,4-Dioxane	µg/L	4							**8.3**	J	<16		U	<16	**31**		<6.4	**40**		<1.6	**8.8**		<1.6	3.8		<1.6
	2-Butanone (MEK)	µg/L	4000								UJ	<20		U	<10		U	<20		U	<20		U	<20		UJ	<20
	Acetone	µg/L	5600								U	<20	3.1	J	<10		U	<20		U	<20		U	<20		U	<20
	Acrylonitrile	µg/L	0.05								UJ	<10		U	<5		U	<10		U	<10		U	<10		U	<10
	Benzene	µg/L	5								UJ	<2		U	<1		U	<2	1.1	J	<2		U	<2		U	<2
	Carbon tetrachloride	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Chloroform	µg/L	80								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	cis/trans1,2-Dichloroethene	µg/L	100								UJ	<4		U	<2		U	<4		U	<4		U	<4		U	<4
	cis-1,2-Dichloroethene	µg/L	70								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Dichloromethane (Methylene chloride)	µg/L	5							**6.9**		<2		U	<1		UJ-	<2		U	<2		U	<2		U	<2
	Ethyl benzene	µg/L	700								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Ethyl methacrylate	µg/L	260								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Methyl Isobutyl Ketone (MIBK)	µg/L	800								UJ	<10		U	<5		U	<10		U	<10		U	<10		U	<10
	n-Propylbenzene	µg/L	52								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Styrene	µg/L	100								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Tetrachloroethene	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Tetrahydrofuran	µg/L	227								UJ	<10		U	<5		U	<10	3.6	J	<10		U	<10		U	<10
	Toluene	µg/L	1000								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Trichloroethene	µg/L	5								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Vinyl Chloride	µg/L	2								UJ	<2		U	<1		U	<2		U	<2		U	<2		U	<2
	Xylenes (unspecified)	µg/L	10000								UJ	<4		U	<2		U	<4		U	<4		U	<4		U	<4
	Total VOCs	µg/L								15.2			3.1			31			44.7			8.8			3.8		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540														U	<5									
	3/4-Methylphenol	µg/L	470														U	<10									
	bis(2-Ethylhexyl) phthalate	µg/L	6														U	<5									
	Naphthalene	µg/L	100														U	<5									
	N-Nitrosodibutylamine	µg/L	0.003														U	<10									
	N-Nitrosopyrrolidine	µg/L	0.03														U	<10									
	o-Toluidine	µg/L	0.2													**3.2**	J	<10									
	Phenol	µg/L	2000														U	<5									
	Pyridine	µg/L	9														U	<25									
Metals																											
	Arsenic	µg/L	10							**474**		<1	**469**		<2	**107**		<1	**103**		<1	**202**		<1	**1010**		<2
	Arsenic, Dissolved	µg/L	10							**481**		<1	**492**		<2	**84.6**		<1	**74.2**		<1	**73.3**		<1	**119**		<2
	Manganese	µg/L	300							**6530**		<3	**6000**		<3	**2020**		<3	**1840**		<3	**1320**		<3	**1520**		<3
	Manganese, Dissolved	µg/L	300							**6580**		<3	**6080**		<3	**2220**		<3	**1760**		<3	**1240**		<3	**1350**		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L								8.7		<1		U	<1		U	<1	8.6		<1	4.2		<1		U	<1
	Nitrate	mg/L									UJ	<0.05	0.049	J	<0.05		U	<0.05		U	<0.05		U	<0.05		UJ	<0.05
	Sulfate	mg/L								21.3		<5	22		<5	45.3		<25	41.2	J-	<10	45.8		<10	38.3		<10
Field Parameters																											
	Dissolved Oxygen	mg/L								0.56			0.66			0.46			0.81			0.38			0.95		
	Iron, Ferrous	mg/L								0.0035			0.0025			3			4.5			0.003			NM		
	Oxidation Reduction Potential	mV								-112.7			-45.5			-74.1			-65.4			-38.9			-123.5		
	pH	SU								5.95			6.1			6.68			6.82			6.88			6.82		
	Specific Conductivity	µS/cm								955			1142			618			525			550			457		
	Temperature	°C								12.01			14.79			13.35			5.47			10.85			16.26		
	Turbidity	NTU								3.1			6.48			8.24			14.5			19.7			24.5		

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

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"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

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QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				MW-14			MW-14			MW-14			MW-14			MW-16D (Not Measured)			MW-16D (Not Measured)			MW-16D (Not Measured)			MW-16D (Not Measured)		
				10/11/2017			1/25/2018			4/25/2018			7/12/2018			10/11/2017			1/25/2018			4/24/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200		U	<1		U	<1		U	<1		U	<1												
	1,1,2-Trichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	1,1-Dichloroethane	µg/L	360		U	<1	1.3		<1	1.6		<1	1.9		<1												
	1,1-Dichloroethene	µg/L	7		U	<1		U	<1		U	<1		U	<1												
	1,2-Dichloroethane	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	1,2-Dichloropropane	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	1,4-Dichlorobenzene	µg/L	75		U	<1		U	<1		U	<1		U	<1												
	1,4-Dioxane	µg/L	4		U	<1.6	**4**		<1.6	3.9		<1.6	**4.1**		<1.6												
	2-Butanone (MEK)	µg/L	4000		U	<10		U	<10		U	<10		U	<10												
	Acetone	µg/L	5600		U	<10		U	<10		U	<10		U	<10												
	Acrylonitrile	µg/L	0.05		U	<5		U	<5		U	<5		U	<5												
	Benzene	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	Carbon tetrachloride	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	Chloroform	µg/L	80		U	<1		U	<1		U	<1		U	<1												
	cis/trans1,2-Dichloroethene	µg/L	100		U	<2	1.1	J	<2	0.87	J	<2	0.86	J	<2												
	cis-1,2-Dichloroethene	µg/L	70		U	<1	1.1		<1	0.87	J	<1	0.86	J	<1												
	Dichloromethane (Methylene chloride)	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	Ethyl benzene	µg/L	700		U	<1		U	<1		U	<1		U	<1												
	Ethyl methacrylate	µg/L	260		U	<1		U	<1		U	<1		U	<1												
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<5		U	<5		U	<5		U	<5												
	n-Propylbenzene	µg/L	52		U	<1		U	<1		U	<1		U	<1												
	Styrene	µg/L	100		U	<1		U	<1		U	<1		U	<1												
	Tetrachloroethene	µg/L	5		U	<1		U	<1		U	<1		U	<1												
	Tetrahydrofuran	µg/L	227		U	<5		U	<5		U	<5		U	<5												
	Toluene	µg/L	1000		U	<1		U	<1		U	<1		U	<1												
	Trichloroethene	µg/L	5		U	<1	1.1		<1	0.71	J	<1	1.1		<1												
	Vinyl Chloride	µg/L	2		U	<1		U	<1		U	<1		U	<1												
	Xylenes (unspecified)	µg/L	10000		U	<2	0.67	J	<2		U	<2		U	<2												
	Total VOCs	µg/L		0			9.27			7.95			8.82														
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540		U	<5																					
	3/4-Methylphenol	µg/L	470		U	<10																					
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<5																					
	Naphthalene	µg/L	100		U	<5																					
	N-Nitrosodibutylamine	µg/L	0.003		U	<10																					
	N-Nitrosopyrrolidine	µg/L	0.03		U	<10																					
	o-Toluidine	µg/L	0.2		U	<10																					
	Phenol	µg/L	2000		U	<5																					
	Pyridine	µg/L	9		U	<25																					
Metals																											
	Arsenic	µg/L	10	1.8		<1	**11.5**		<1	**14.4**		<1	**18**		<2												
	Arsenic, Dissolved	µg/L	10	0.63	J	<1	9.3		<1	**17.1**		<1	**17.9**		<2												
	Manganese	µg/L	300	228		<3	274		<3	283		<3	238		<3												
	Manganese, Dissolved	µg/L	300	160		<3	184		<3	248		<3	237		<3												
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L			U	<1		U	<4.9	3.6		<1		U	<1												
	Nitrate	mg/L			U	<0.05		U	<0.05		U	<0.05	0.27	J	<0.05												
	Sulfate	mg/L		22.9		<5	44.3		<10	45.3		<10	42.1		<5												
Field Parameters																											
	Dissolved Oxygen	mg/L		0.45			0.99			0.99			1.32														
	Iron, Ferrous	mg/L		0			0			0.001			0.003														
	Oxidation Reduction Potential	mV		104.4			-61.3			-34.1			-99.3														
	pH	SU		6.8			6.98			7.13			6.68														
	Specific Conductivity	µS/cm		236			442			395			333														
	Temperature	°C		13.76			7.96			10.5			14.34														
	Turbidity	NTU		6.32			3.02			1.1			3.22														

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Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				MW-17D (Not Measured)			MW-17D (Not Measured)			MW-17D (Not Measured)			MW-17D			MW-1R			MW-1R			MW-1R			MW-1R		
				10/11/2017			1/25/2018			4/24/2018			7/12/2018			10/11/2017			1/26/2018			4/25/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200											U	<1		U	<1									
	1,1,2-Trichloroethane	µg/L	5											U	<1		U	<1									
	1,1-Dichloroethane	µg/L	360											U	<1		U	<1									
	1,1-Dichloroethene	µg/L	7											U	<1		U	<1									
	1,2-Dichloroethane	µg/L	5											U	<1		U	<1									
	1,2-Dichloropropane	µg/L	5											U	<1		U	<1									
	1,4-Dichlorobenzene	µg/L	75											U	<1		U	<1									
	1,4-Dioxane	µg/L	4										2.1		<1.6		U	<1.6									
	2-Butanone (MEK)	µg/L	4000											U	<10		U	<10									
	Acetone	µg/L	5600											U	<10		U	<10									
	Acrylonitrile	µg/L	0.05											U	<5		U	<5									
	Benzene	µg/L	5											U	<1		U	<1									
	Carbon tetrachloride	µg/L	5											U	<1		U	<1									
	Chloroform	µg/L	80											U	<1		U	<1									
	cis/trans1,2-Dichloroethene	µg/L	100											U	<2		U	<2									
	cis-1,2-Dichloroethene	µg/L	70											U	<1		U	<1									
	Dichloromethane (Methylene chloride)	µg/L	5											U	<1		UJ-	<1									
	Ethyl benzene	µg/L	700											U	<1		U	<1									
	Ethyl methacrylate	µg/L	260											U	<1		U	<1									
	Methyl Isobutyl Ketone (MIBK)	µg/L	800											U	<5		U	<5									
	n-Propylbenzene	µg/L	52											U	<1		U	<1									
	Styrene	µg/L	100											U	<1		U	<1									
	Tetrachloroethene	µg/L	5											U	<1		U	<1									
	Tetrahydrofuran	µg/L	227											U	<5		U	<5									
	Toluene	µg/L	1000											U	<1		U	<1									
	Trichloroethene	µg/L	5											U	<1		U	<1									
	Vinyl Chloride	µg/L	2											U	<1		U	<1									
	Xylenes (unspecified)	µg/L	10000											U	<2		U	<2									
	Total VOCs	µg/L											2.1				0			0			0			0		
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540														U	<5									
	3/4-Methylphenol	µg/L	470														U	<10									
	bis(2-Ethylhexyl) phthalate	µg/L	6														U	<5									
	Naphthalene	µg/L	100														U	<5									
	N-Nitrosodibutylamine	µg/L	0.003														U	<10									
	N-Nitrosopyrrolidine	µg/L	0.03														U	<10									
	o-Toluidine	µg/L	0.2														U	<10									
	Phenol	µg/L	2000														U	<5									
	Pyridine	µg/L	9														U	<25									
Metals																											
	Arsenic	µg/L	10										**284**		<2	**13.2**		<1	**65.1**		<1	**14.1**		<1	**13.7**		<2
	Arsenic, Dissolved	µg/L	10										**18.4**		<2	**13.7**		<1	**16.9**		<1	**12.9**		<1	**13.2**		<2
	Manganese	µg/L	300										**1500**		<3	66.6		<3	**2160**		<3	**1680**		<3	**439**		<3
	Manganese, Dissolved	µg/L	300										**1370**		<3	**309**		<3	193		<3	181		<3	150		<3
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L												U	<1		U	<1		U	<1		U	<1		U	<1
	Nitrate	mg/L											0.042	J	<0.05		U	<0.05		U	<0.05		U	<0.05		U	<0.05
	Sulfate	mg/L											18.1		<5	16.1		<5	14.1		<5	15.1		<5	14.9		<5
Field Parameters																											
	Dissolved Oxygen	mg/L											6.82			0.37			0.18			0.43			1.27		
	Iron, Ferrous	mg/L														0			0			0			0		
	Oxidation Reduction Potential	mV											137.7			226.7			-235.2			51.8			149.7		
	pH	SU											6.8			8.22			8.29			8.15			7.52		
	Specific Conductivity	µS/cm											196			247			217			200			157		
	Temperature	°C											13.66			13.32			7.68			9.33			11.63		
	Turbidity	NTU											3.38			12.4			12.9			17.6			8.68		

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Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																			
				MW-1S			MW-1S			MW-1S			MW-1S			MW-22B (Not Measured)			MW-22B (Not Measured)			MW-22B (Not Measured)			MW-22B (Not Measured)		
				10/11/2017			1/26/2018			4/25/2018			7/11/2018			10/11/2017			1/26/2018			4/24/2018			7/11/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																											
	1,1,1-Trichloroethane	µg/L	200		U	<1		U	<1		U	<2		U	<1												
	1,1,2-Trichloroethane	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	1,1-Dichloroethane	µg/L	360		U	<1		U	<1		U	<2		U	<1												
	1,1-Dichloroethene	µg/L	7		U	<1		U	<1		U	<2		U	<1												
	1,2-Dichloroethane	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	1,2-Dichloropropane	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	1,4-Dichlorobenzene	µg/L	75		U	<1		U	<1		U	<2		U	<1												
	1,4-Dioxane	µg/L	4		U	<1.6		U	<1.6		U	<1.6		U	<1.6												
	2-Butanone (MEK)	µg/L	4000		U	<10		U	<10		U	<20		U	<10												
	Acetone	µg/L	5600		U	<10		U	<10		U	<20		U	<10												
	Acrylonitrile	µg/L	0.05		U	<5		U	<5		U	<10		U	<5												
	Benzene	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	Carbon tetrachloride	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	Chloroform	µg/L	80		U	<1		U	<1		U	<2		U	<1												
	cis/trans1,2-Dichloroethene	µg/L	100		U	<2		U	<2		U	<4		U	<2												
	cis-1,2-Dichloroethene	µg/L	70		U	<1		U	<1		U	<2		U	<1												
	Dichloromethane (Methylene chloride)	µg/L	5		UJ-	<1		U	<1		U	<2		U	<1												
	Ethyl benzene	µg/L	700		U	<1		U	<1		U	<2		U	<1												
	Ethyl methacrylate	µg/L	260		U	<1		U	<1		U	<2		U	<1												
	Methyl Isobutyl Ketone (MIBK)	µg/L	800		U	<5		U	<5		U	<10		U	<5												
	n-Propylbenzene	µg/L	52		U	<1		U	<1		U	<2		U	<1												
	Styrene	µg/L	100		U	<1		U	<1		U	<2		U	<1												
	Tetrachloroethene	µg/L	5		U	<1		U	<1		U	<2	0.46	J	<1												
	Tetrahydrofuran	µg/L	227		U	<5		U	<5		U	<10		U	<5												
	Toluene	µg/L	1000		U	<1		U	<1		U	<2		U	<1												
	Trichloroethene	µg/L	5		U	<1		U	<1		U	<2		U	<1												
	Vinyl Chloride	µg/L	2		U	<1		U	<1		U	<2		U	<1												
	Xylenes (unspecified)	µg/L	10000		U	<2		U	<2		U	<4		U	<2												
	Total VOCs	µg/L		0			0			0			0.46														
Semi Volatile Organic Compounds																											
	2-Methylphenol	µg/L	540		U	<5																					
	3/4-Methylphenol	µg/L	470		U	<10																					
	bis(2-Ethylhexyl) phthalate	µg/L	6		U	<5																					
	Naphthalene	µg/L	100		U	<5																					
	N-Nitrosodibutylamine	µg/L	0.003		U	<10																					
	N-Nitrosopyrrolidine	µg/L	0.03		U	<10																					
	o-Toluidine	µg/L	0.2		U	<10																					
	Phenol	µg/L	2000		U	<5																					
	Pyridine	µg/L	9		U	<25																					
Metals																											
	Arsenic	µg/L	10	**40.8**		<1	**62.3**		<1	**85.9**		<1	**31.2**		<2												
	Arsenic, Dissolved	µg/L	10	4		<1	5.7		<1		U	<4	2.2		<2												
	Manganese	µg/L	300	**426**		<3	**439**		<3	198		<3	294		<3												
	Manganese, Dissolved	µg/L	300	**392**		<3	**394**		<3	189		<3	**301**		<3												
Natural Attenuation Parameters																											
	Total Organic Carbon (TOC)	mg/L			U	<1	6.9		<1	18.7		<1		U	<1												
	Nitrate	mg/L			U	<0.05	0.028	J	<0.05	0.13		<0.05	0.13		<0.05												
	Sulfate	mg/L		17.7		<5	7.6		<5	8.3		<5	18.9		<5												
Field Parameters																											
	Dissolved Oxygen	mg/L		0.51			0.01			0.18			1.83														
	Iron, Ferrous	mg/L		0			0.5			0.0005			0.0005														
	Oxidation Reduction Potential	mV		194.1			-233.2			101			146														
	pH	SU		6.39			5.96			5.74			6.25														
	Specific Conductivity	µS/cm		230			166			95			155														
	Temperature	°C		14.28			5.83			8.79			13.12														
	Turbidity	NTU		5.59			6.96			362.7			22.1														

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QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Table 2- Groundwater Monitoring Results
Sutton Brook Disposal Area Superfund Site
Tewksbury, MA

Method Group	Parameter	Units	Groundwater Performance Standards (µg/L)	Downgradient Groundwater Area Including GSA																							
				MW-22M (Not Measured)			MW-22M (Not Measured)			MW-22M (Not Measured)			MW-22M (Not Measured)			MW-24M			MW-24M			MW-24M			MW-24M DUP			MW-24M			MW-24M DUP		
				10/11/2017			1/26/2018			4/24/2018			7/11/2018			10/11/2017			1/25/2018			4/25/2018			4/25/2018			7/12/2018			7/12/2018		
				Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL	Result	Qual	QL
Volatile Organic Compounds																																	
	1,1,1-Trichloroethane	µg/L	200													U	<1		U	<1		U	<1		U	<1		UJ	<1		U	<1
	1,1,2-Trichloroethane	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,1-Dichloroethane	µg/L	360													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,1-Dichloroethene	µg/L	7													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloroethane	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,2-Dichloropropane	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dichlorobenzene	µg/L	75													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	1,4-Dioxane	µg/L	4													U	<1.6		U	<1.6		U	<1.6		U	<1.6		U	<1.6		U	<1.6
	2-Butanone (MEK)	µg/L	4000													U	<10		U	<10		U	<10		U	<10		U	<10		U	<10
	Acetone	µg/L	5600													U	<10	3.3	J	<10		U	<10		U	<10		U	<10		U	<10
	Acrylonitrile	µg/L	0.05													U	<5		U	<5		U	<5		U	<5		U	<5		U	<5
	Benzene	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Carbon tetrachloride	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Chloroform	µg/L	80													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	cis/trans1,2-Dichloroethene	µg/L	100													U	<2		U	<2		U	<2		U	<2		U	<2		U	<2
	cis-1,2-Dichloroethene	µg/L	70													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Dichloromethane (Methylene chloride)	µg/L	5													UJ-	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Ethyl benzene	µg/L	700													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Ethyl methacrylate	µg/L	260													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Methyl Isobutyl Ketone (MIBK)	µg/L	800													U	<5		U	<5		U	<5		U	<5		U	<5		U	<5
	n-Propylbenzene	µg/L	52													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Styrene	µg/L	100													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrachloroethene	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Tetrahydrofuran	µg/L	227													U	<5		U	<5		U	<5		U	<5		U	<5		U	<5
	Toluene	µg/L	1000													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Trichloroethene	µg/L	5													U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Vinyl Chloride	µg/L	2													U	<1		U	<1	1	J	<1		U	<1		UJ	<1		U	<1
	Xylenes (unspecified)	µg/L	10000													U	<2		U	<2		U	<2		U	<2		U	<2		U	<2
	Total VOCs	µg/L														0			3.3			1			0			0			0		
Semi Volatile Organic Compounds																																	
	2-Methylphenol	µg/L	540													U	<5																
	3/4-Methylphenol	µg/L	470													U	<10																
	bis(2-Ethylhexyl) phthalate	µg/L	6													U	<5																
	Naphthalene	µg/L	100													U	<5																
	N-Nitrosodibutylamine	µg/L	0.003													U	<10																
	N-Nitrosopyrrolidine	µg/L	0.03													U	<10																
	o-Toluidine	µg/L	0.2													U	<10																
	Phenol	µg/L	2000													U	<5																
	Pyridine	µg/L	9													U	<25																
Metals																																	
	Arsenic	µg/L	10													0.63	J	<1	0.81	J	<1		U	<1		U	<1	1.3	J	<2	1.3	J	<2
	Arsenic, Dissolved	µg/L	10													0.46	J	<1	0.48	J	<1		U	<1		U	<1		U	<2		U	<2
	Manganese	µg/L	300													233		<3	**495**		<3	**619**		<3	**614**		<3	**673**	J-	<3	**659**		<3
	Manganese, Dissolved	µg/L	300													191		<3	**381**		<3	**541**		<3	**516**		<3	**621**		<3	**619**		<3
Natural Attenuation Parameters																																	
	Total Organic Carbon (TOC)	mg/L														U	<1		U	<1		U	<1		U	<1		U	<1		U	<1
	Nitrate	mg/L														1.1		<0.05	24.5		<0.05	22.8		<0.05	25		<0.05	23	J	<0.05	21.6	J	<0.05
	Sulfate	mg/L														18.2		<5	15.7		<5	18.3		<5	18.9		<5	19.6		<5	20.9		<5
Field Parameters																																	
	Dissolved Oxygen	mg/L														0.43			0.53			0.48						1.09					
	Iron, Ferrous	mg/L														0			0			0.0005											
	Oxidation Reduction Potential	mV														256.6			205.1			259.3						390.7					
	pH	SU														5.59			5.76			5.61						4.89					
	Specific Conductivity	µS/cm														366			334			464						344					
	Temperature	°C														14.09			9.63			10.24						13.07					
	Turbidity	NTU														10.1			7.2			2.8						7.5					

Notes:

"J" = The reported value was obtained from a reading that was less than the QL but greater than or equal to the method detection limit, estimated value provided

"J+" = Estimated J value with a possible high bias

"J-" = Estimated J value with a possible low bias

"U" = Compound not detected above method detection limit, quantitation limit provided.

"UJ" = The analyte was not detected above the method detection limit, quantitation limit provided. However, the reported quantitation limit is approximate.

"UJ-" = Estimated non-detec with possible low bias

QL = Quantitation Limit

Qual = Laboratory and/or data validation Qualifier

For the detailed reasons for the "Not Measured" well locations, see the tables in Appendix A.

Shading & bold indicates exceedance of Groundwater Performance Standards (µg/L)

Groundwater Performance Standards from Record of Decision, SBDA, September, 2007.

Appendix E
Interviews

INTERVIEW RECORD

Site Name: Sutton Brook Superfund Site	**EPA ID No.:** MAD980520696	
Subject: Five Year Review	**Time:**	**Date:3/15/19**
Type: ☐ Telephone ☐ Visit ■ Other **Location of Visit:**	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: Don McElroy	**Title: Project Manager**	**Organization: USEPA**

Individual Contacted:

Name: Dorothy Allen	**Title: Project Manager**	**Organization: MassDEP**
Telephone: 617-292-5795 **Fax No.** **E-mail Address:** **dorothy.t.allen@state.ma.us**	**Street Address:** **BWSC – MassDEP** **One Winter Street** **Boston, MA 02108**	

Preface:

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1.A. What is your overall impression of the project? (general sentiment)

Remedial Action and Post Remedial Action O&M have and continue to accomplish remedial objectives.

2.A. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

Routine communication has occurred frequently during Remedial Action and continues at reduced frequency during Post Remedial Action O&M. The purpose of the communication has been and is to review reporting and activities and to provide state MassDEP oversight and input.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results of the response.

No complaints, violations or incidents required response from the state MassDEP.

4.A. Do you feel well informed about the site's activities and progress?

Yes, the state MassDEP has been adequately information about site's progress.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

None

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

The Institutional Controls (NAULs) should commence and be completed in accordance with Consent Decree and SOW.

2.B. Are you aware of any community concerns regarding the site? Provide details.

Town of Tewksbury has been planning to locate solar power generating facility on the site. MassDEP Solid Waste Program would be requiring a post closure use permit.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

The site is no longer an open and hazardous area, however, it has been made inaccessible to people and some wildlife.

4.B. Are you aware of any events of vandalism or trespassing at the site?

Evidence of vandalism or trespassing has been documented in O&M reporting.

5.B. Are you aware of any changes in projected land use at or near the site?

MassDEP is not aware of any changes in land use at or near the site with the exception of the planned solar power project.

6.B. Are there any pending changes in laws or regulations that may impact the site?

No

7.B. Do you have any suggestions or recommendations regarding the project?

Institutional Controls (NAULs) should be completed as soon as possible and in coordination with the planned solar project.

8.B. **Is there any other information that you wish to share that might be of use?**

No

INTERVIEW RECORD

Site Name: Sutton Brook Disposal Area Superfund Site	**EPA ID No.:** MAD980520696	
Subject: Five Year Review	**Time:**	**Date:** 03/15/19
Type: ■ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: Don McElroy	**Title:** RPM	**Organization:** U.S. EPA

Individual Contacted:

Name: James Campbell	**Title:** Project Coordinator	**Organization:** Engineering Management, Inc.
Telephone No.: 412-244-0917 **Fax No.:** N/A **E-Mail Address:** jrc@e-emi.com	**Street Address:** 1500 Ardmore Blvd., Suite 502, Pittsburgh, PA 15221	

Preface:

1.A. What is your overall impression of the project? (general sentiment)

The Remedial Action was implemented in accordance with ROD goals and design objectives. The Operation and Maintenance (O&M) phase has proceeded according to plan, with capping system and groundwater extraction system functioning as intended.

2.A. Is the remedy functioning as expected? How well is the remedy performing?

The remedy is functioning as expected and the Site is overall protective of human health and the environment.

3.A. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

The monitoring data show that constituent concentrations in groundwater are generally

stable or decreasing, with about 80% of the various constituent-monitoring well pairs showing stable/decreasing trends. Most of the increasing trends are in or near source areas where it may take some time to showing decreasing values.

4.A. Please describe staff and frequency of site inspections and O&M activities.
O&M activities are conducted in accordance with the approved O&M Plans. Site inspections were conducted quarterly through 2018 and will be conducted semi-annually beginning in 2019. Sampling events are conducted quarterly and the extraction well system is inspected monthly, with daily remote operational checks.

5.A. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routes since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
Beaver dams have caused flooding in the low-lying areas of the Site, affecting access to several monitoring wells. A beaver control contractor was retained to inspect the Site ahead of the scheduled quarterly sampling events. Beavers are removed and dams breached as necessary. However, flooding has prevented quarterly sampling of some monitoring wells.

6.A. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.
See answer to 5.A., above.

7.A. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.
We started conducting beaver activity inspections with both beaver control and O&M contractor personnel. This improved the efficiency and timeliness of flood control measures.

8.A. Do you have any comments, suggestions, or recommendations regarding the project?
Continue to implement O&M activities to document the protectiveness of the remedy.

SUPPLEMENTAL QUESTIONS

1.B. Are you aware of any land use changes which would impact the protectiveness of the current remedy?

No land use changes which could impact the protectiveness of the remedy have occurred.

2.B. Are inspection records up-to-date?

Yes. Inspection and monitoring reports are submitted on a quarterly basis.

3.B. Have there been any Health & Safety issues on site?

No. Extra precaution is taken in flooded areas to protect sampling crews.

4.B. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

Trespassing by ATV and dirt bikes occurred, causing damage to a personnel-gate and relatively minor erosion issues. However, placement of bollards at the gate has stopped trespassing, at least up to the present.

5.B. Have there been any events of vandalism at the property?

See answer to 4.B., above.

6.B. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

Beaver dams have caused flooding in the low-lying areas of the Site affecting access to several monitoring wells. A beaver control contractor was retained to inspect the Site ahead of the scheduled quarterly sampling events. Beavers are removed and dams breached as necessary. However, flooding has prevented quarterly sampling of some monitoring wells.

7.B. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

Not that we are aware of.

8.B. Discuss any operational adjustments which have been implemented since construction close-out, as well as any potential adjustments currently being considered.
We continue to adjust our response to flooding caused by beaver activity.

9.B. Is the system performing as expected?
Yes.

10.B Anything to note regarding the wetland mitigation components of the remedy?
The vegetation in the wetland areas continues to grow and thrive, meeting the intent of the design.

11.B. Provide a summary of the types of problems or errors that have been made in the prior 5 years.
Other than the flooding and trespassing issues discussed above, we have not experienced any problems or errors.

12.B. Are there any uses of the neighboring properties which are of concern as they relate to the remedy?
Not that we are aware of.

13.B. How frequently are authorized individuals present at the property (days/week)?
O&M personnel are physically at the Site at least at least once a month, and in many months for multiple days.

14.B. What measures have been taken to secure the site and the contaminated areas (e.g., fencing, locks, etc.)? How successful have these measures been?
The Site has a perimeter security fence, and other than the trespassing issue discussed above, the Site is secure.

Wrap-Up

1.D. Do you have any recommendations for reducing or increasing activities at the site?
Yes. We completed two years of semi-annual wetland inspections and monitoring, as outlined in the O&M Plan. Each of the wetland areas has established a healthy and

vigorously growing wetland community that exceeds performance standards. As such, we would like to request a reduction in wetland monitoring such that additional future wetland monitoring will be performed as part of the site-wide 5-year reviews, as described in the O&M Plan.

2.D. Is there any other information that you wish to share that might be of use?
Not at this time.

INTERVIEW RECORD

Site Name: Sutton Brook Superfund Site	**EPA ID No.:** MAD980520696	
Subject: Five Year Review	**Time:** 13:00	**Date: 04/11/19**
Type: ☐ Telephone ■ Visit ☐ Other **Location of Visit:** Tewksbury Town Hall		

Contact Made By:

Name:	**Title:**	**Organization:**
Sean Czarniecki	Sr. Project Engineer	AECOM

Individual Contacted:

Name:	**Title:**	**Organization:**
Richard Montuori (RM) Steve Sadwick (SS) Kevin Hardiman (KH)	Town Manager Asst. Town Manager Town Engineer	Town of Tewksbury
E-mail Address: ssadwick@tewksbury-ma.gov		

Preface:

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1.A. What is your overall impression of the project? (general sentiment)

RM – It couldn't have gone better.
SS – Community was well-informed and with all of the fear about trucks on the roads, there were no complaints.
KH – It went well.

2.A. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

KH – Kevin attended the site meetings and is still receiving email notifications about the site.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results

of the response.

All – None.

4.A. Do you feel well informed about the site's activities and progress?

All – Yes, they feel well informed.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

All – None.

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

All – None.

2.B. Are you aware of any community concerns regarding the site? Provide details.

All – None.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

RM/SS – The landfill being closed is a big help. Prior to closure, people thought they could die. House sales and values have improved in the area.

4.B. Are you aware of any events of vandalism or trespassing at the site?

RM/SS – Only the previous ATV issues which occurred during construction.
KH – Snowmobilers, although this past winter didn't have enough snow for it to be a problem. In the past, the trespassers took down fencing.

5.B. Are you aware of any changes in projected land use at or near the site?

SS – Solar farm coming.

6.B. **Are there any pending changes in laws or regulations that may impact the site?**

RM/SS – Land use controls were briefly discussed. The town looked into the potential to rezone the site, but don't think this is the best way to go, as it should be tied to the property such that a future rezoning doesn't impact the site. A deed restriction is the better way to go.

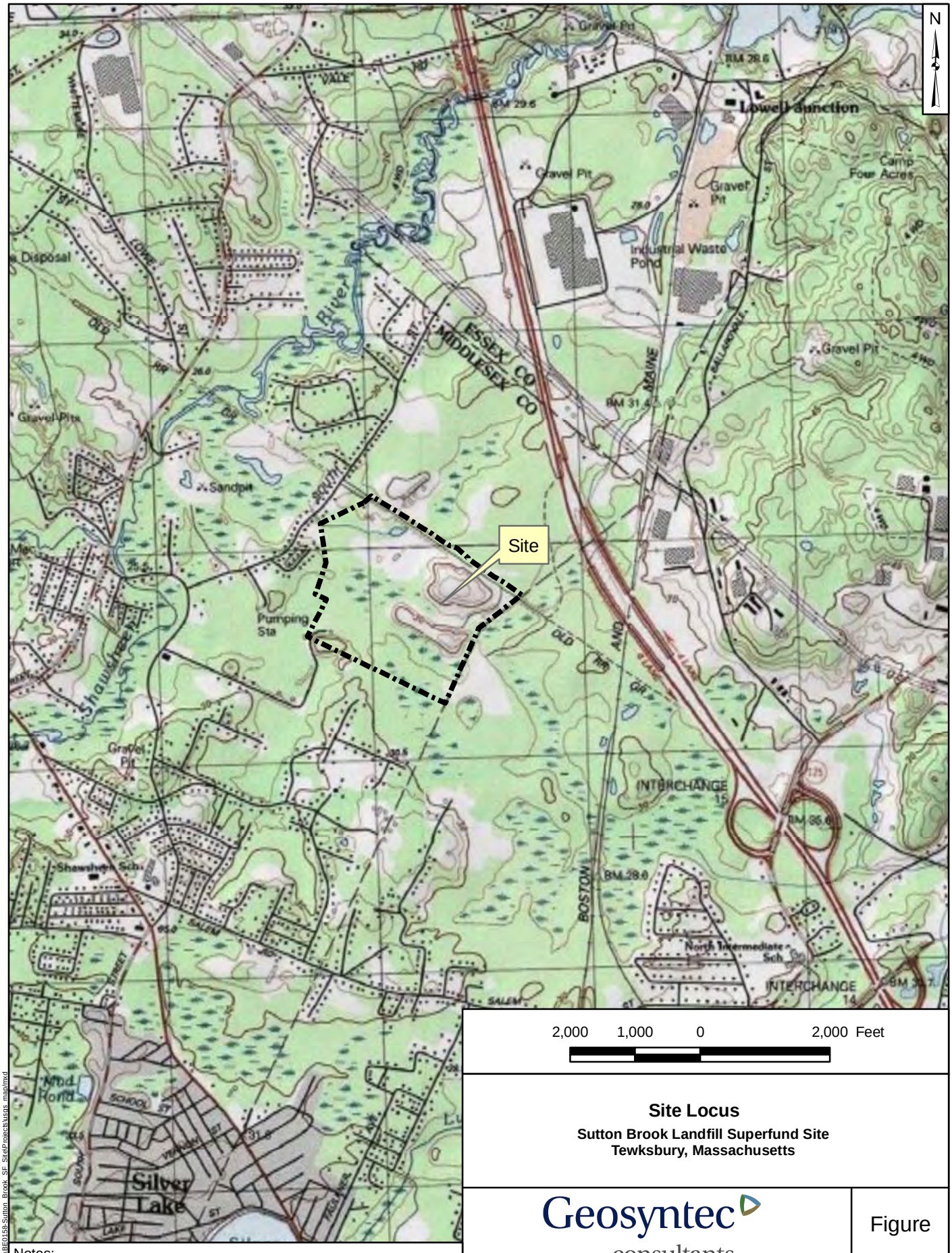
7.B. **Do you have any suggestions or recommendations regarding the project?**

RM – None.
KH – Kevin wished that more thought was given towards post-closure use. He noted that he would have pushed for that more during design if he was involved at the time. There could have been better opportunities developed at that time.

8.B. **Is there any other information that you wish to share that might be of use?**

RM/SS – With respect to the solar farm, there is an issue with gaining access via the railroad ROW. They wish that EPA would have maintained access beyond just construction as access is now an issue.

Appendix F
Site Figures



Notes:
Topo imagery obtained from ESRI USA Topographic Maps, 2009 National Geographic Society, i-cubed

Site Locus

Sutton Brook Landfill Superfund Site
Tewksbury, Massachusetts

Geosyntec consultants

Acton, Massachusetts | May 2014

Figure **1**

O:\GIS\Projects\BE0158-Sutton_Brook_SF_Site\Projects\sysins_map.mxd



Legend

- Disposal Area
- Edge of Waste
- Debris Pile
- Town Boundary

500 250 0 500 Feet

Site Map

Sutton Brook Landfill Superfund Site
Tewksbury, Massachusetts

Notes:
- Aerial imagery obtained from MassGIS (2005).
- Disposal Area, Edge of Waste and point locations obtained from Woodard & Curran CAD file: ANSBF-02 Lobes 5-1a.dwg

Geosyntec consultants

Acton, Massachusetts | May 2014

Figure 2

Q:\GISProjects\BE0158-Sutton_Brook_SF_Site\Projects\site_map.mxd

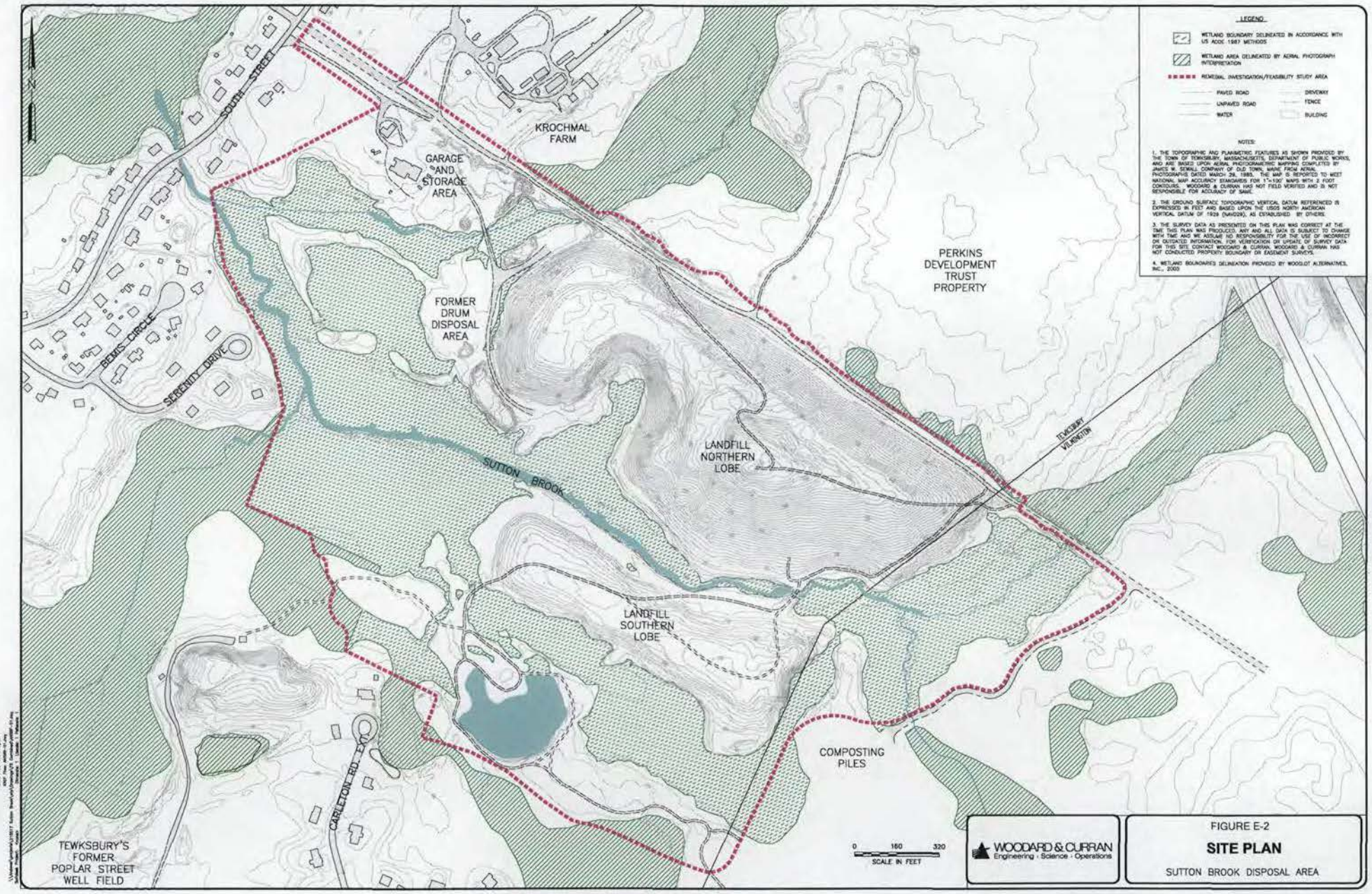
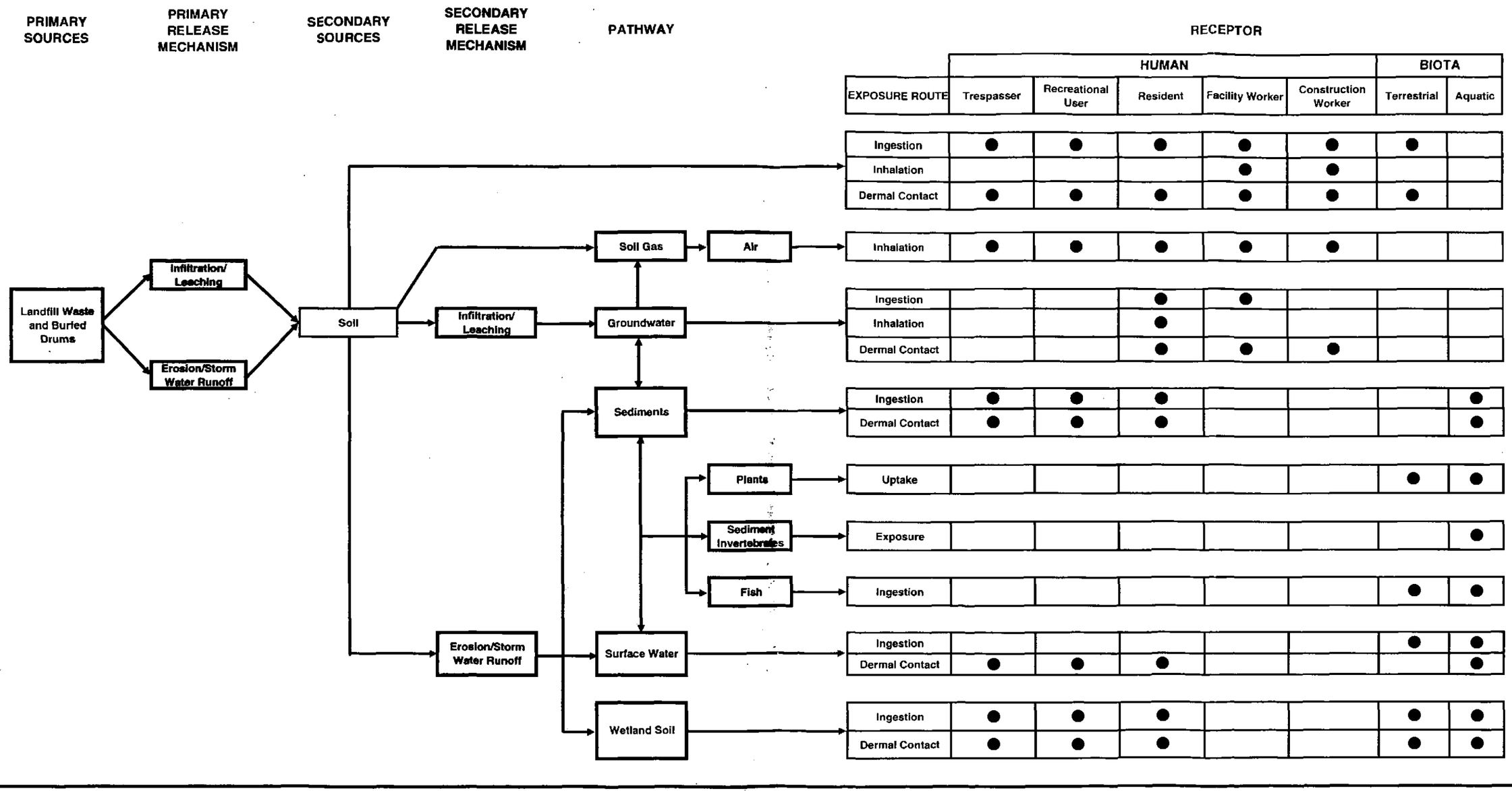

N
SOUTH STREET
KROCHMAL FARM
GARAGE AND STORAGE AREA
PERKINS DEVELOPMENT TRUST PROPERTY
FORMER DRUM DISPOSAL AREA
BEMIS CIRCLE
SERENITY DRIVE
SUTTON BROOK
LANDFILL NORTHERN LOBE
TEWKSBURY VILLAMATION
LANDFILL SOUTHERN LOBE
COMPOSTING PILES
CARLETON RD. EXT.
TEWKSBURY'S FORMER POPLAR STREET WELL FIELD
LEGEND
WETLAND BOUNDARY DELINEATED IN ACCORDANCE WITH US ACOE 1987 METHODS
WETLAND AREA DELINEATED BY AERIAL PHOTOGRAPH INTERPRETATION
REMEDIAL INVESTIGATION/FEASIBILITY STUDY AREA
PAVED ROAD
UNPAVED ROAD
WATER
DRIVEWAY
FENCE
BUILDING
NOTES:
1. THE TOPOGRAPHIC AND PLANIMETRIC FEATURES AS SHOWN PROVIDED BY THE TOWN OF TEWKSBURY, MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS, AND ARE BASED UPON AERIAL PHOTOGRAMMETRIC MAPPING COMPLETED BY JAMES W. SEWALL COMPANY OF OLD TOWN, MAINE FROM AERIAL PHOTOGRAPHS DATED MARCH 28, 1985. THE MAP IS REPORTED TO MEET NATIONAL MAP ACCURACY STANDARDS FOR 1"=100' MAPS WITH 2 FOOT CONTOURS. WOODARD & CURRAN HAS NOT FIELD VERIFIED AND IS NOT RESPONSIBLE FOR ACCURACY OF SAME.
2. THE GROUND SURFACE TOPOGRAPHIC VERTICAL DATUM REFERENCED IS EXPRESSED IN FEET AND BASED UPON THE USGS NORTH AMERICAN VERTICAL DATUM OF 1929 (NAVD29), AS ESTABLISHED BY OTHERS.
3. THE SURVEY DATA AS PRESENTED ON THIS PLAN WAS CORRECT AT THE TIME THIS PLAN WAS PRODUCED. ANY AND ALL DATA IS SUBJECT TO CHANGE WITH TIME AND WE ASSUME NO RESPONSIBILITY FOR THE USE OF INCORRECT OR OUTDATED INFORMATION. FOR VERIFICATION OF UPDATE OF SURVEY DATA FOR THIS SITE CONTACT WOODARD & CURRAN. WOODARD & CURRAN HAS NOT CONDUCTED PROPERTY BOUNDARY OR EASEMENT SURVEYS.
4. WETLAND BOUNDARIES DELINEATION PROVIDED BY WOODLOT ALTERNATIVES, INC., 2005
0 160 320
SCALE IN FEET
WOODARD & CURRAN
Engineering · Science · Operations
FIGURE E-2
SITE PLAN
SUTTON BROOK DISPOSAL AREA

Figure E-1


PRIMARY SOURCES
PRIMARY RELEASE MECHANISM
SECONDARY SOURCES
SECONDARY RELEASE MECHANISM
PATHWAY
RECEPTOR
HUMAN
BIOTA
EXPOSURE ROUTE
Trespasser
Recreational User
Resident
Facility Worker
Construction Worker
Terrestrial
Aquatic
Landfill Waste and Buried Drums
Infiltration/ Leaching
Erosion/Storm Water Runoff
Soil
Soil Gas
Air
Infiltration/ Leaching
Groundwater
Sediments
Plants
Sediment Invertebrates
Fish
Erosion/Storm Water Runoff
Surface Water
Wetland Soil
Ingestion
Inhalation
Dermal Contact
Uptake
Exposure