Third Five-Year Review Report
Waldick Aerospace Devices Superfund Site
Wall Township, Monmouth County, New Jersey

Prepared by:
U.S. Environmental Protection Agency
Region 2
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Approved by:

Date:

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
ICs	Institutional Controls
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
ROD	Record of Decision
RPM	Remedial Project Manager
TBC	To be considered

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 third FYR for the Waldick Aerospace Devices Superfund Site (Site). The triggering action for this policy review is September 27, 2013, the signature date of the previous FYR. The FYR has been prepared because the remedial actions, upon completion, will not leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure (UU/UE), but requires five years or more to complete.

The Site consists of 2 operable units (OUs) and OU2 will be addressed in this FYR. OU2 addresses the ongoing groundwater remedy. The OU1 remedy remediated soils to levels that allow for UU/UE.

The Waldick Aerospace Devices Superfund Site FYR was led by Ms. Pamela J. Baxter, Ph.D., CHMM, Remedial Project Manager. Participants included Mr. Michael Scorca, Hydrogeologist; Mr. Charles Nace, Risk Assessor; and Ms. Wanda Ayala, Community Involvement Coordinator. The review began on November 2, 2017.

Site Background

The Waldick Aerospace Devices Site is a former industrial facility located at 2121 State Route 35 in the Sea Girt section of Wall Township, Monmouth County, New Jersey. It includes 1.72 acres which appear as Block 733, Lot 5, on the Monmouth County tax map. It is bordered to the east by Route 35, to the south by commercial property, and to the north and west by undeveloped woodland. The site was originally developed in the 1950s. For approximately 25 years, the site was used for office space and storing plumbing supplies. In 1979, the property was leased for the manufacture and plating of metal components for the aerospace industry.

East of Route 35, most properties are residential. The nearest residence to the site is approximately 100 yards west of the site. According to the 2009 census tract, the population of Wall Township is approximately 26,500 people.

The site is underlain by the Cohansey and Kirkwood formations, both of which are saturated and part of the Kirkwood-Cohansey aquifer system. The Cohansey formation is about 30 feet thick

and made up of medium-fine sand and gravel, while the top of the Kirkwood lies about 30 feet below ground surface and contains silt with fine sand and clay. The sands of the Cohansey in this area have a moderate permeability (estimated hydraulic conductivity of 60 feet per day), while the underlying Kirkwood near this site has a much lower permeability.

Groundwater generally flows in a southeasterly direction from the site property toward Hannabrand Brook, which is about 850 feet away. The brook flows to the northeast and merges with a smaller stream and continues to flow eastward into Wreck Pond, which drains into the Atlantic Ocean.

Soil and groundwater, as well as two buildings were contaminated by Waldick. A third building, not used by the Waldick firm, has been used in recent years for several retail operations.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Waldick Aerospace Devices		
EPA ID: NJD054981337		
Region: 2	**State:** NJ	**City/County:** Wall Township, Monmouth County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Pamela J. Baxter, Ph.D., CHMM
Author affiliation: Remedial Project Manager
Review period: September 2013 – April 2018
Date of site inspection: November 28, 2017
Type of review: Policy
Review number: 3
Triggering action date: September 27, 2013
Due date *(five years after triggering action date)*: September 27, 2018

II. RESPONSE ACTION SUMMARY

Basics for Taking an Action

From April 12, 1985, through September 29, 1987, EPA conducted a remedial investigation and feasibility study (RI/FS) to determine the nature and extent of contamination to evaluate cleanup options. Soil and groundwater were found to be contaminated with VOCs, petroleum hydrocarbons and metals. A contaminated groundwater plume was found to extend to Hannabrand Brook, which is approximately 850 feet east of the property.

As part of the previously conducted RI/FS, a public health evaluation (PHE) was conducted to estimate the hazards and risks associated with the current and future effects of contaminants on human health and the environment. In the PHE, it was determined that inhalation of volatile organic compounds released while showering and ingestion of contaminated groundwater, evaluated under a hypothetical future use scenario, were the only pathways of exposure considered potentially hazardous to humans. Maximum estimation for noncancer hazards was calculated as 34.9, which exceeds the acceptable value of 1, and carcinogenic risk was calculated as 2×10^{-4} which is slightly above the acceptable risk range of 10^{-6} to 10^{-4}.

In 2008, a new risk evaluation was performed for contaminants that exceeded the Maximum Contaminant Levels (MCLs). EPA's statistical evaluation of the cadmium and PCE in groundwater, if used as a potable drinking water source for residents in the future, would result in an unacceptable hazard index (HI) of 5.6 for the adult resident and 13 for the child resident. The cancer risks associated with exposure to PCE (1.8×10^{-5} - adult; 8.6×10^{-6} -child) were within the acceptable cancer risk range of 10^{-6} to 10^{-4}.

As discussed in the 2008 ROD, potential ecological exposure to contamination associated with the Site could occur in Hannabrand Brook. Groundwater contamination had migrated from the Site to the brook based on the presence of PCE and cadmium in seep sampling performed at the brook. Surface water and seep sampling is performed as part of the groundwater monitoring program being implemented at the Site. PCE was detected in a seep at Hannabrand Brook at 2.1 µg/L and cadmium was detected at 1.3 µg/L at the same location. However, both of those concentrations are below ecological screening values. Cadmium and PCE were not detected in surface water samples obtained from Hannabrand Brook.

Response Actions

The New Jersey Department of Environmental Protection (NJDEP) conducted an inspection of the facility in June 1982 and revealed that a series of degreasing, dipping, rinsing and plating tanks, as well as a polishing machine, were discharging wastewater, through pipes, directly onto the ground around the main building. Sampling revealed that buildings, soil and groundwater were contaminated with chlorinated hydrocarbons, and chromium, cadmium and other heavy metals. In June 1983, state and county officials excavated about 80 cubic feet of contaminated soil.

From April 22, 1986 through August 2, 1986, a removal action was conducted to remove hazardous chemicals that were an immediate threat. The work included sampling drums and other containers and segregating, overpacking and disposing of the containers and their contents. All were disposed of at a licensed off-site disposal facility.

On September 29, 1987, a Record of Decision (ROD) was signed by EPA selecting a remedy for contaminated soils and buildings at the site, referred to as OU1. A decision on the groundwater remedy was deferred to a future ROD. The remedy included the following:

- In-situ air stripping to treat contaminated soils around and under the main building;
- Excavation and off-site disposal of all treated soils with residual contamination above action levels;
- Decontamination or demolition of on-site buildings, depending on the volume of soils beneath the main building that require excavation and off-site disposal; and
- Installation of additional groundwater wells, establishment of an environmental monitoring program, complete fencing of the site to restrict access, and well restrictions.

On March 29, 1991, a second ROD was signed to address groundwater contamination (OU2) and amend the 1987 OU1 soil remedy. The remedial action objectives (RAOs) for the interim groundwater remedy are:

- To prevent further migration of the highly contaminated portion of the groundwater contaminant plume;
- To reduce the contaminant concentrations; and
- To evaluate the aquifer's response to the extraction and treatment measures.

The remedy included the following:

- On-site thermal treatment to remove organic contaminants from soils;
- Solidification/stabilization treatment for inorganic contaminated soils;
- Backfilling or off-site disposal of treated soil;
- Extraction of contaminated groundwater from the zone of highest contamination concentrations;
- On-site treatment of the extracted groundwater;
- Reinjection of the treated groundwater; and
- Additional groundwater monitoring and investigation to further characterize the overall contaminant plume and to evaluate the effectiveness of the above remedial measures.

After considerable pre-design investigation and natural attenuation studies, it was determined that the groundwater plume, which originally consisted of cadmium, chromium, nickel, PCE and trichloroethene (TCE), had decreased significantly. The studies showed that the concentrations of chromium, nickel and TCE were no longer present above state or federal MCLs. Cadmium

and PCE were present in limited areas above MCLs. Due to the significant decrease in plume size and contaminant concentrations, a pump and treat remedy was no longer necessary. As a result of these studies, EPA amended the OU2 groundwater remedy on September 20, 2008. The ROD selected a final remedy for groundwater.

The RAO for the remedy is to restore the groundwater to beneficial use as a drinking water source.

The final OU2 groundwater remedy included the following:

- The implementation of a long-term groundwater sampling and analysis program to monitor the contaminant concentrations in the groundwater at the site; and
- Institutional controls in the form of a NJDEP groundwater classification exception area (CEA).

Status of Implementation

The soils remedial action portion (OU1) of the 1991 ROD was completed in 1993. The main and the auxiliary buildings were demolished and approximately 4,600 cubic yards of contaminated soils were treated on-site using low-temperature thermal desorption, and residuals were sent off-site for stabilization and solidification and disposal at a RCRA permitted landfill. Regular groundwater monitoring (as described below) is performed for OU2.

Institutional Controls

The ROD Amendment recognized that the State of New Jersey, in accordance with its regulations, will require the establishment of an institutional control (in the form of a CEA) to ensure the affected groundwater is not used for potable purposes until contaminant concentrations are below drinking water standards. The implementation of the CEA is expected to be completed by September 2020.

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)
Media (groundwater)	Yes	Yes	N/A	restrict installation of ground water wells and ground water use until contaminant concentrations reach drinking water standards	CEA 9/2020

Operation and Maintenance

Operation and maintenance activities are limited to annual groundwater sampling events. The current monitoring network is comprised of seven wells (at four locations) in the area downgradient of the property. During the fall of 2012, Hurricane Sandy destroyed or rendered inaccessible two wells and the surface water and seep sampling locations. Groundwater samples collected from wells were analyzed for VOCs and metals. Prior to the loss of the two downgradient wells (MW-111-S and MW-112-S), PCE concentrations in both wells had dropped below the NJDEP groundwater standard and the cadmium concentration dropped to below the standard in MW-111-S and was just slightly above (5.4 ug/L) the standard in MW-112-S.

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.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 1: Protectiveness Determinations/Statements from the 2013 FYR

OU #	Protectiveness Determination	Protectiveness Statement
2	Short-term Protective	The remedy at OU2 protects human health and the environment in the short-term. However, in order for the remedy to be protective in the long-term, a CEA needs to be put in place.
Sitewide	Short-term Protective	The remedy at this site protects human health and the environment in the short-term. However, in order for the remedy to be protective in the long-term, a CEA needs to be put in place.

Table 2: Status of Recommendations from the 2013 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Institutional Control is not Implemented	Put a CEA in place	Addressed in Next FYR	The USACE is working with EPA to establish a CEA at the site.	9/30/2020

IV. FIVE-YEAR REVIEW PROCESS

Community Notification Involvement & Site Interviews

On October 2, 2017, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 31 Superfund sites in New York and New Jersey, including the Waldick Aerospace Devices site. The announcement can be found at the following web address: https://wcms.epa.gov/sites/production/files/2017-10/documents/five_year_reviews_fy2018_final.pdf. In addition, to this notification, a public notice was made available by posting on the Town's webpage on March 27, 2018 stating that there was a FYR and inviting the public to submit any comments to the U.S. EPA. The results of the review and report will be made available at the Site information repository located at Wall Township Public Library, 2700 Allaire Road, Wall, New Jersey 07719.

Data Review

Sampling trip reports, final sampling reports, and sampling data were reviewed and analyzed for sampling events conducted in March 2013, March 2014, April 2015, October 2015, June 2016, January 2017, March 2017, August 2017 and April 2018. The current monitoring network is comprised of seven wells (at four locations) in the area downgradient of the property. Groundwater samples collected from wells were analyzed for VOCs and metals.

In summary, the major site related contaminants that continue to be detected above federal and state standards are PCE and cadmium. The trends of PCE and cadmium concentrations in groundwater are discussed in more detail below. In addition to these two constituents, a small number of well samples had concentrations of total chromium and nickel that exceeded groundwater standards. To better understand these results and confirm the cadmium plume is stable, future samples will also be analyzed for dissolved metals to help evaluate the geochemical conditions.

PCE plume

The ROD selected the NJDEP Class IIA groundwater quality criterion for PCE of 1 ug/L as the cleanup level for the PCE contaminated plume. Overall, as seen in the charts, detected PCE concentrations are slightly above NJDEP's groundwater standards in just two wells during the last five years (RD-101-S and MW-102-M). The most recent groundwater sampling round in April 2018, PCE slightly exceeded the groundwater quality criterion at only one well (RD-101-S with 2.6 ug/L). Sampling of natural attenuation parameters are no longer being conducted because the results of previous sampling rounds for natural attenuation parameters (selected organics, inorganics and chemical properties) concluded that conditions for anaerobic biodegradation are not present at the site; therefore, the decreasing concentrations of PCE are attributable to other processes, such as diffusion or dispersion, rather than biodegradation. This conclusion is supported by the observation that currently no significant quantities of breakdown (daughter) products of PCE were detected in the groundwater during the last five years.

In summary, source remediation activities effectively removed continuing source of the PCE groundwater plume. Natural attenuation processes are limited to dispersion and dilution and isolated low-level residual contamination remains on site with PCE concentrations just slightly above the state groundwater standard of 1 ug/L.

Cadmium plume

The ROD selected the NJDEP Class IIA groundwater quality criterion for cadmium of 4 ug/L as the cleanup level for the contaminated plume. Concentrations of cadmium at RD-101-S during 2006 to 2014 ranged between about 80 and 110 ug/L, but have since declined to 61 ug/L in the 2018 sampling event.

Well MW-102-S (21 feet deep) is about 130 feet farther downgradient than RD-101-S. Cadmium concentrations have remained consistently low with concentrations (ranging from 3 to 5.6 ug/L) during the last five years. Well MW-102-M (30.5 feet deep) is at the same cluster and historically has had higher concentrations of cadmium compared to MW-102S, ranging between 2.9 and 13 ug/L during this five-year review period.

Wells MW-104-S (16.5 feet deep) and MW-104-M (28.5 feet deep) are about 500 feet downgradient of the site property. During this five-year review period, cadmium concentrations at MW-104-S rose above the groundwater criterion from 2014 to 2016, reaching as high as 13 ug/L. However, concentrations declined to below the criterion again in 2017 and 2018. Samples from the deeper well MW-104-M have had some slight exceedances of the cadmium criterion during the last five years (ranging from 4.1 to 6 ug/L).

Wells MW-105-S (16.6 feet deep) and MW-105-M (26 feet deep) are at a cluster that is considered side-gradient, on the outer perimeter of the affected area. In well MW-105-S cadmium is usually detected in samples; however, no sample has ever exceeded the criterion of 4 ug/L. The deeper well MW-105-M also has had no samples ever exceed the criterion and cadmium has only been detected once at this well since 2006 (1.9 ug/L in October 2015).

Overall cadmium concentrations in wells downgradient of the site property generally are continuing to decrease over time. Cadmium concentrations at the well nearest the property (RD-101-S) have declined during the last five years, but remain well above the groundwater criterion. However, the two wells at the next downgradient cluster (MW-102-S and MW-102-M) have not had increasing cadmium concentrations and the furthest downgradient well cluster (MW-104-S and MW-104-M) has remained below groundwater criterion with an exception of a short-lived exceedance.

Although the acidic natural pH condition and the presence of dissolved oxygen (4 to 7 mg/L) in groundwater are favorable to cadmium in the dissolved state, thus far there has been no indication of any significant transport of the cadmium from the most-affected area (well RD-101-S) to downgradient groundwater.

Site Inspection

The inspection of the Site was conducted on November 28, 2017. In attendance were Ms. Pamela J. Baxter, Ph.D., CHMM, Remedial Project Manager; and Mr. Michael Scorca, Hydrogeologist.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

The monitored natural attenuation component of the final OU2 remedy is functioning as intended. Evaluation of the well sampling results show an overall decrease in PCE and cadmium concentrations over the last five years. In addition, well analysis indicates that the PCE plume is localized and stable and data shows no indication of significant migration of cadmium plume.

The main site-related groundwater contaminants that continue to be detected above federal and state standards are PCE and cadmium. The PCE plume is localized and concentrations are only slightly above the state MCL of 1 ug/L. The cadmium plume shows an overall decreasing trend with the most downgradient well showing concentrations below the groundwater standards with the exception of a short-term exceedance. In addition to these two constituents, a small number of well samples had concentrations of total chromium and nickel that exceeded groundwater standards. To better understand these results and confirm the cadmium plume is stable, future groundwater samples will also be analyzed for dissolved metals to help evaluate the geochemical conditions.

The 2008 ROD amendment called for establishing a CEA to prevent groundwater use. The CEA is not in place but is anticipated to be completed by 2020. There are currently no public wells installed within the plume area, thus, the pathway is not currently complete. The CEA will ensure that no wells would be permitted for installation in the area.

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

Question B Summary:

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the 1987 ROD, 1991 ROD Amendment, and 2008 ROD amendment are still valid.

Human Health

The exposure assumptions used to estimate the potential risk and hazards at the site for the two operable unit risk assessments followed acceptable EPA guidance at the time the assessments were conducted and are still valid. The 2008 ROD Amendment also included a risk assessment evaluation that followed current guidance and using current toxicity values. The exposure pathways, exposure assumptions, and toxicity values that were evaluated for the reevaluation are still valid.

As was noted in the 2013 five-year review, vapor intrusion was a pathway that was not evaluated previously. The potential for vapor intrusion was evaluated in the previous five-year review and it was determined that the vapor intrusion pathway was not complete since the maximum detected value of PCE in the groundwater was 3.6 ug/l, which is less than the value (13.6 ug/l) associated with groundwater screening value for vapor intrusion. The maximum value of PCE detected in the groundwater since the last five-year review was 2.3 ug/l, which is still below the screening value of 13.6 ug/l, therefore vapor intrusion remains an incomplete pathway.

The cleanup levels chosen for the soil remedy were listed as the NJDEP Cleanup Objectives. The NJDEP Soil Cleanup Criteria were updated in 2011, and the values listed in the 1987 Record of Decision were compared to the updated NJDEP Soil Cleanup Criteria. All of the soil cleanup values listed in the 1987 Record of Decision were equal to or more stringent than the current NJDEP Soil Cleanup Criteria, therefore, the values used are still valid. The cleanup levels chosen for the groundwater remedy were listed as the lower of the federal or state Maximum Contaminant Levels (MCLs). These cleanup levels are still valid.

Ecological

The 2013 five-year review stated that exposure parameters and toxicity values used for the ecological assessment were still valid. The primary ecological concern is groundwater discharging to Hannabrand Brook. Although the groundwater seeps and surface water were not monitored to measure PCE and cadmium in the most recent monitoring events, the closest monitoring well to the brook, 104S, was measured. PCE was not detected and cadmium was detected at 3.5 ug/l, which is below the NJDEP groundwater value of 4 ug/L. Given that the PCE and cadmium concentrations in a shallow well near the brook did not have elevated concentrations, there would be no cause for ecological concern related to the groundwater plume. The cleanup values and remedial action objectives used at the time of the remedy selection are still valid and protective of the environment.

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

There has not been any other information that has come to light that could call into question the protectiveness of the remedies that have been selected to date.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the Five-Year Review:				
None				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): None	**Issue Category: Institutional Controls**			
	Issue: Need to implement a CEA at the Site			
	Recommendation:			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	USACE	EPA	9/20

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: OU-2	*Protectiveness Determination:* Short-term Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The implemented actions at OU2 are protective of human health and the environment. All exposure pathways that could result in unacceptable risks are being controlled. In order to be protective in the long-term, the CEA will need to be implemented.		

VIII. NEXT REVIEW

The next FYR report for the Waldick Aerospace Devices Superfund Site is required in five years from the completion date of this review.

ATTACHMENT A – TABLES

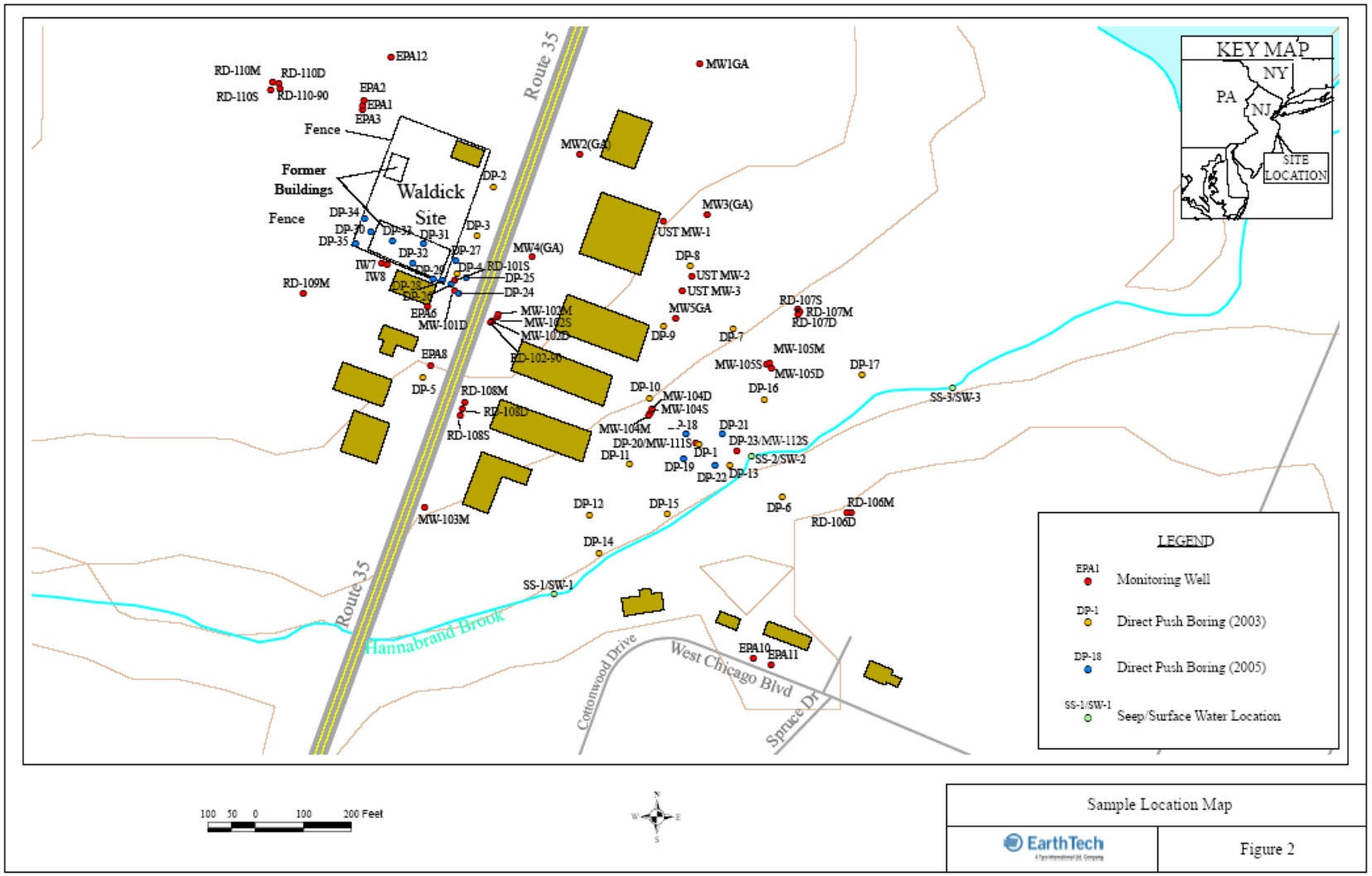
Table 1 - Chronology of Site Events	
Event	**Date(s)**
Waldick Aerospace Devices, Inc. leased the site for manufacture and plating of metal components for the aerospace industry	1979 – 1984
NJDEP inspected the facility and revealed various degreasing, dip, rinse and plating tanks, etc, were discharging directing onto the ground	June 1982
EPA proposed the site for inclusion on the NPL	October 1984
EPA initiated a RI/FS	April 1985
EPA conducted a removal action to remove hazardous chemicals	April 22, 1986 – August 2, 1986
The site was listed on the NPL	June 1986
A ROD was issued to address contaminated buildings and soil, and to investigate groundwater contamination	September 29, 1987
A supplemental RI/FS was initiated to more fully characterize the groundwater contamination	December 1988
A second ROD was issued to anticipate a final groundwater remedy to restore the aquifer to the lower federal or state drinking water MCLs	March 29, 1991
The remedial design of the groundwater remedy was initiated	June 1991
The soil treatment of the ROD was completed and approximately 4,600 cubic yards of soil were removed. Two buildings on site were demolished.	1993
Remedial design activity was suspended at 35% phase due to contaminant levels decreasing rapidly	1997
A two-year period of quarterly monitoring begun, in which contaminant levels would be observed for continued decline	February 1997
First five-year review completed	February 23, 2000
A pre-design investigation was conducted to establish the current location of the contaminant plume, both vertically and horizontally	2003
A Letter Report for the Pre-Design Investigation was finalized	September 2004
Semiannual sampling events commenced	2006
Proposed Plan was finalized	August 13, 2008
Preliminary Close-Out Report issued	September 30, 2008

Table 1 - Chronology of Site Events	
Event	**Date(s)**
OU-2 ROD was issued to amend groundwater component of the 1991 ROD	September 30, 2008
Post ROD quarterly groundwater sampling commenced	January 10, 2011
Second quarter groundwater sampling conducted	April 11-12, 2011
Third quarter groundwater sampling conducted	July 5-6, 2011
Fourth quarter groundwater sampling conducted	November 7-9, 2011
Semi-annual groundwater sampling conducted	April 17-18, 2012
Semi-annual groundwater sampling conducted	October 16-17, 2012
Five-Year review kick-off meeting	December 18, 2012
Five-Year review site visit	January 31, 2013
Semi-annual groundwater sampling conducted	March 4-5, 2013
Second Five-Year review completed	September 27, 2013
Semi-annual groundwater sampling conducted	March 18-20, 2014
Semi-annual groundwater sampling conducted	April 15, 2015
Semi-annual groundwater sampling conducted	October 26, 2015
Semi-annual groundwater sampling conducted	June 6, 2016
Semi-annual groundwater sampling conducted	January 18, 2017
Semi-annual groundwater sampling conducted	August 7-8, 2017
Five-Year review site visit	November 28, 2017
Commencement of CEA	February 2018

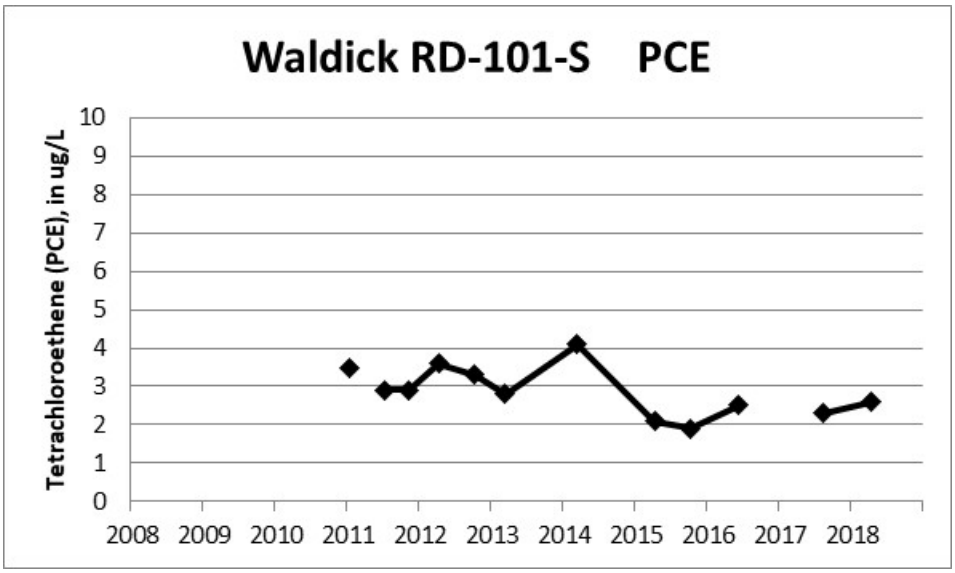
Table 2 - Recommendations and Follow-Up Actions

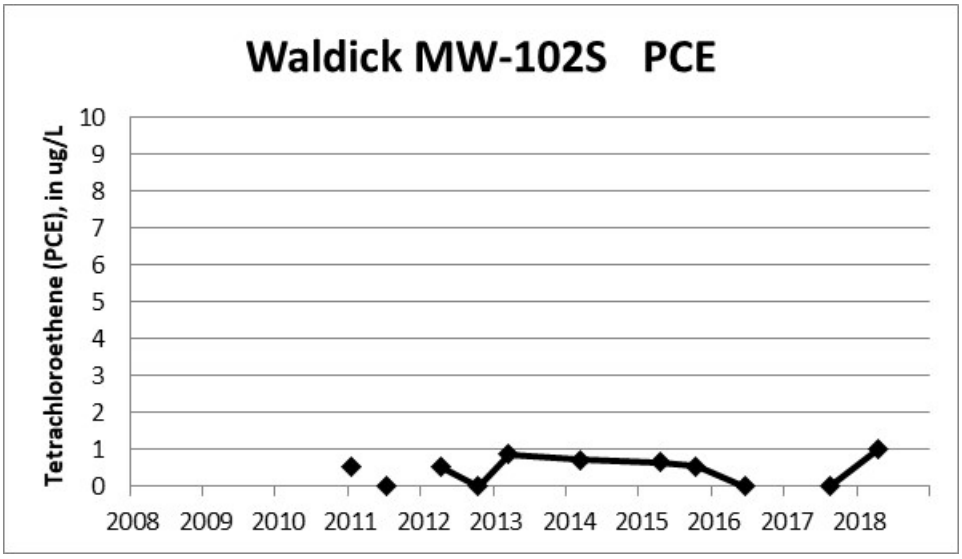
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Institutional Controls not implemented	Implement CEA	USACE	EPA	9/20	N	Y

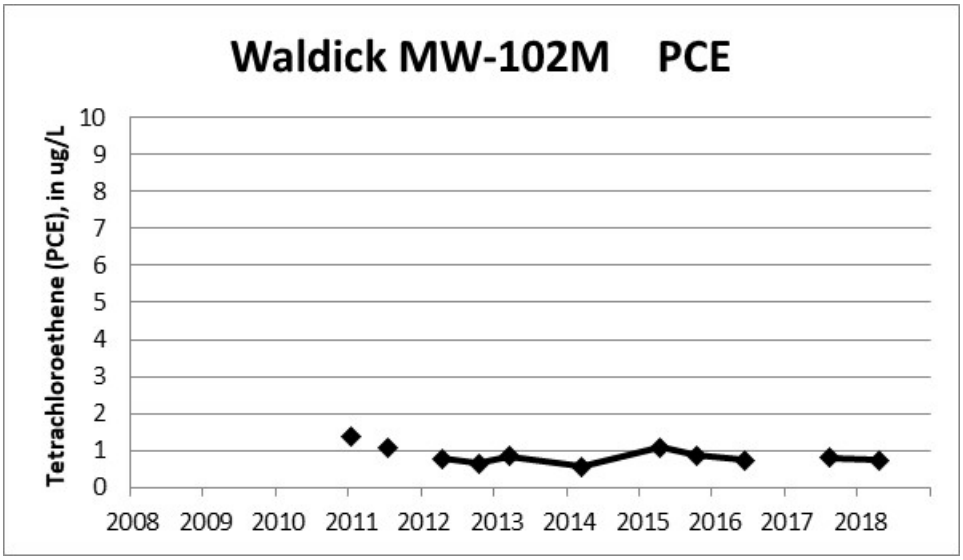
ATTACHMENT B – SITE MAP

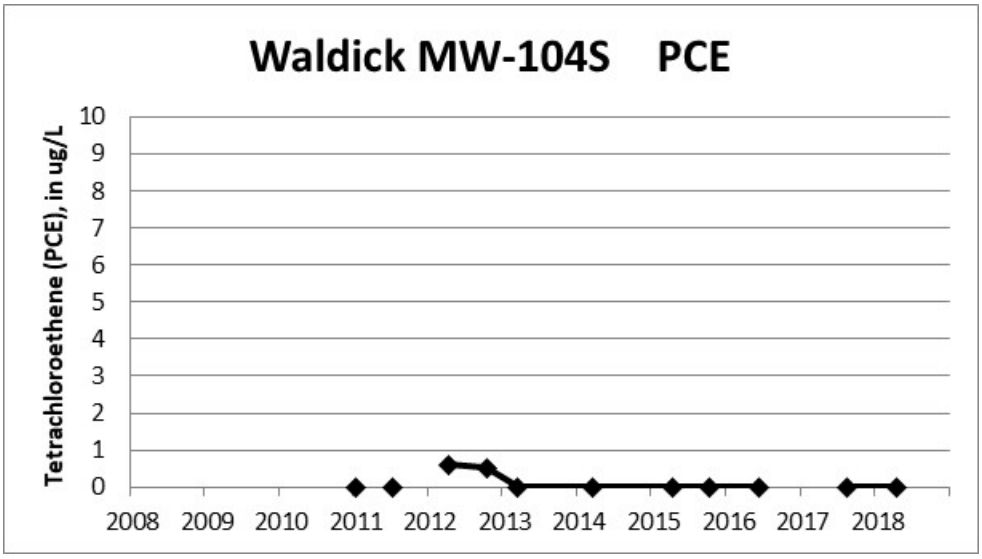

KEY MAP
NY
PA
NJ
SITE LOCATION
Route 35
Waldick Site
Former Buildings
Fence
Hannabrand Brook
Cottonwood Drive
West Chicago Blvd
Spruce Dr
EPA12
RD-110M
RD-110D
RD-110S
RD-110-90
EPA2
EPA1
EPA3
MW1GA
MW2(GA)
DP-2
MW3(GA)
UST MW-1
DP-3
DP-34
DP-30
DP-33
DP-31
DP-35
DP-32
DP-27
MW4(GA)
IW7
IW8
DP-29
DP-4
RD-101S
DP-25
DP-24
RD-109M
DP-8
UST MW-2
UST MW-3
MW5GA
RD-107S
RD-107M
RD-107D
EPA6
MW-101D
MW-102M
MW-102S
MW-102D
DP-9
DP-7
RD-102-50
MW-105M
MW-105S
MW-105D
DP-17
EPA8
DP-5
RD-108M
RD-108D
RD-108S
DP-10
MW-104D
MW-104S
DP-16
SS-3/SW-3
MW-104M
DP-18
DP-21
DP-20/MW-111S
DP-23/MW-112S
DP-11
DP-1
SS-2/SW-2
DP-19
DP-22
DP-13
DP-12
DP-15
DP-6
RD-106M
RD-106D
MW-103M
DP-14
SS-1/SW-1
EPA10
EPA11
LEGEND
EPA1 Monitoring Well
DP-1 Direct Push Boring (2003)
DP-18 Direct Push Boring (2005)
SS-1/SW-1 Seep/Surface Water Location
100 50 0 100 200 Feet
N
W
E
S
Sample Location Map
EarthTech
Figure 2

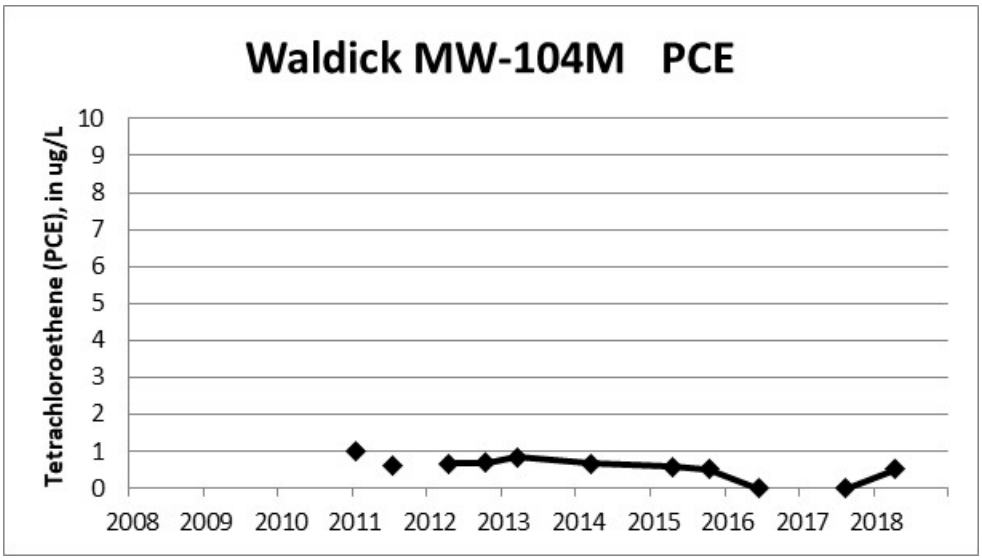
ATTACHMENT C – TREND GRAPHS

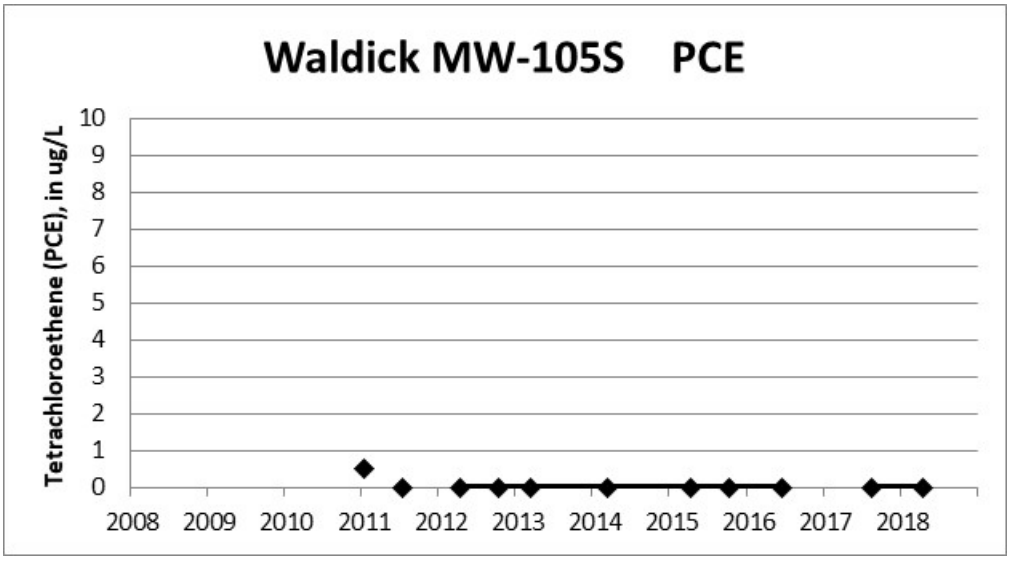

Waldick RD-101-S PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Waldick MW-102S PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-102M PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-104S PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-104M PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-105S PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
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3
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0
2008
2009
2010
2011
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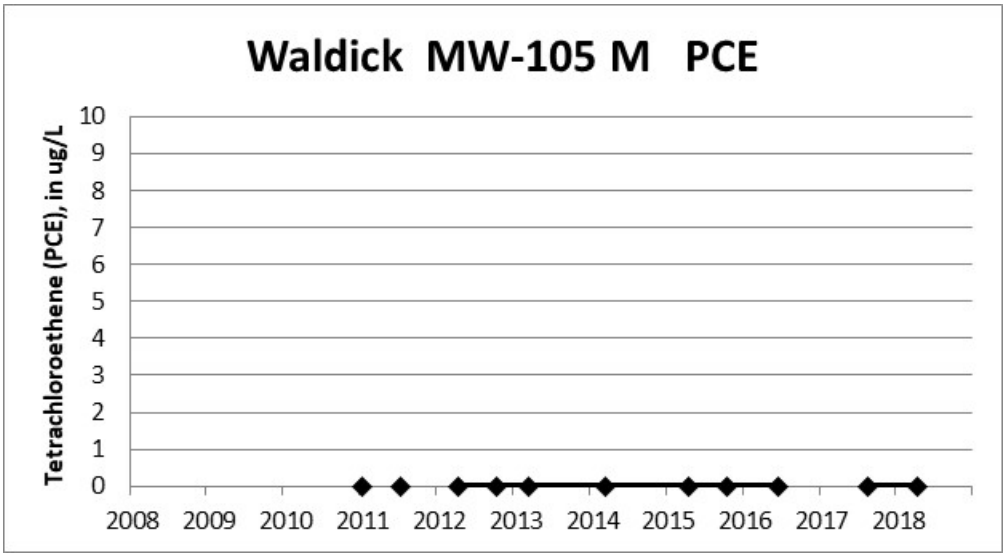
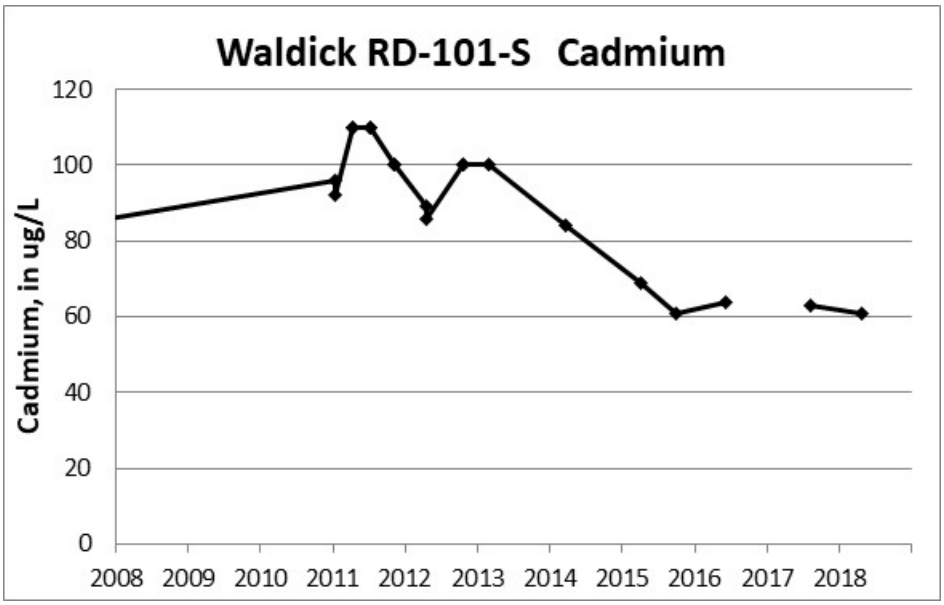
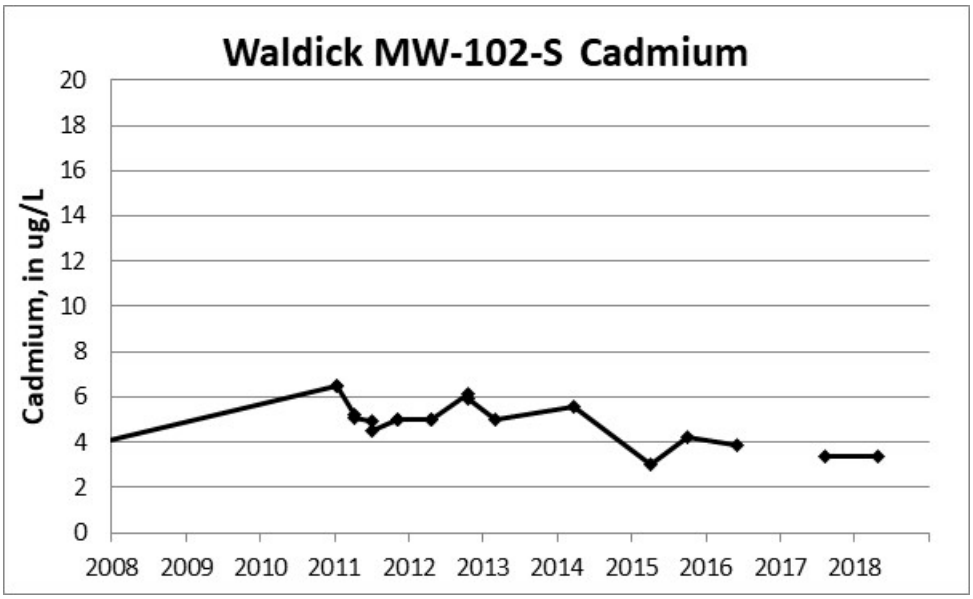
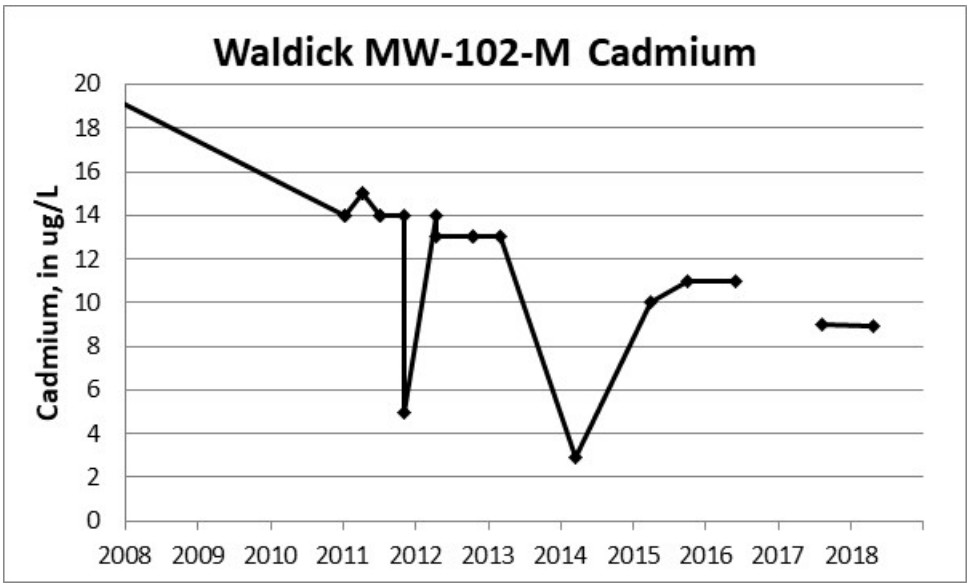
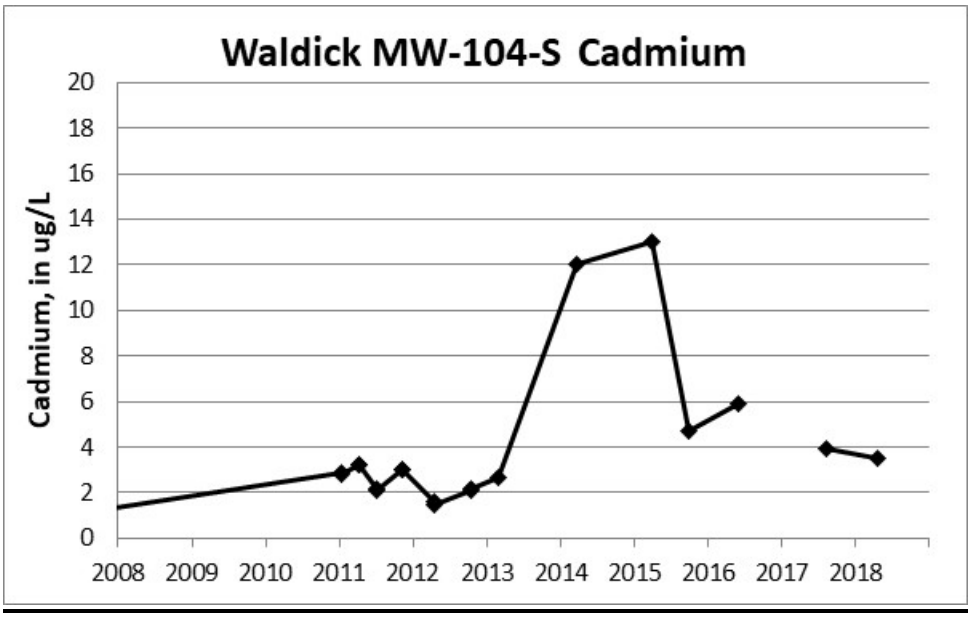
2018

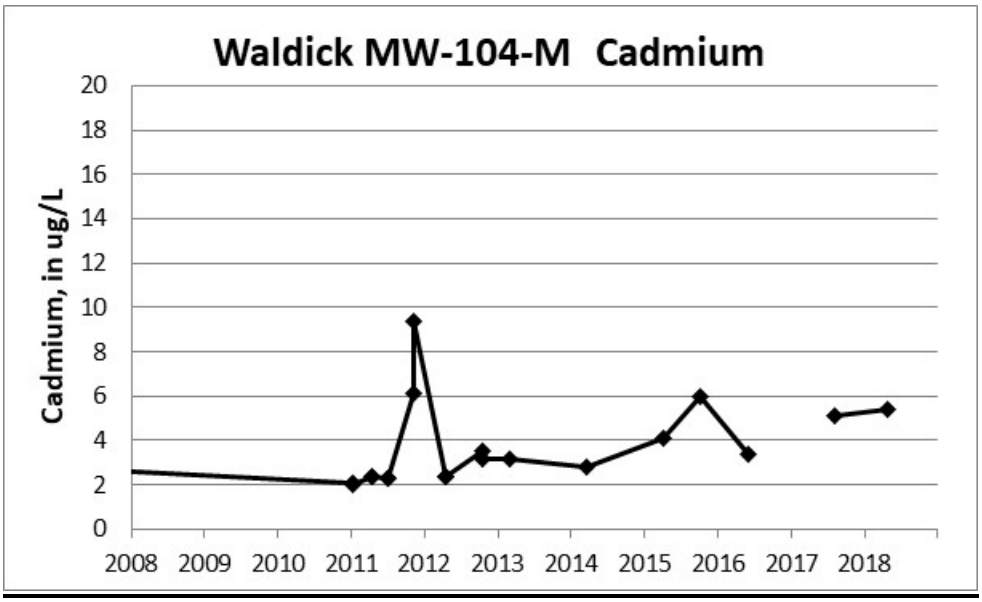

Waldick MW-105 M PCE
Tetrachloroethene (PCE), in ug/L
10
9
8
7
6
5
4
3
2
1
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Waldick RD-101-S Cadmium
Cadmium, in ug/L
120
100
80
60
40
20
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Waldick MW-102-S Cadmium
Cadmium, in ug/L
20
18
16
14
12
10
8
6
4
2
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-102-M Cadmium
Cadmium, in ug/L
20
18
16
14
12
10
8
6
4
2
0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018


Waldick MW-104-S Cadmium
Cadmium, in ug/L
0
2
4
6
8
10
12
14
16
18
20
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Waldick MW-104-M Cadmium
Cadmium, in ug/L
0
2
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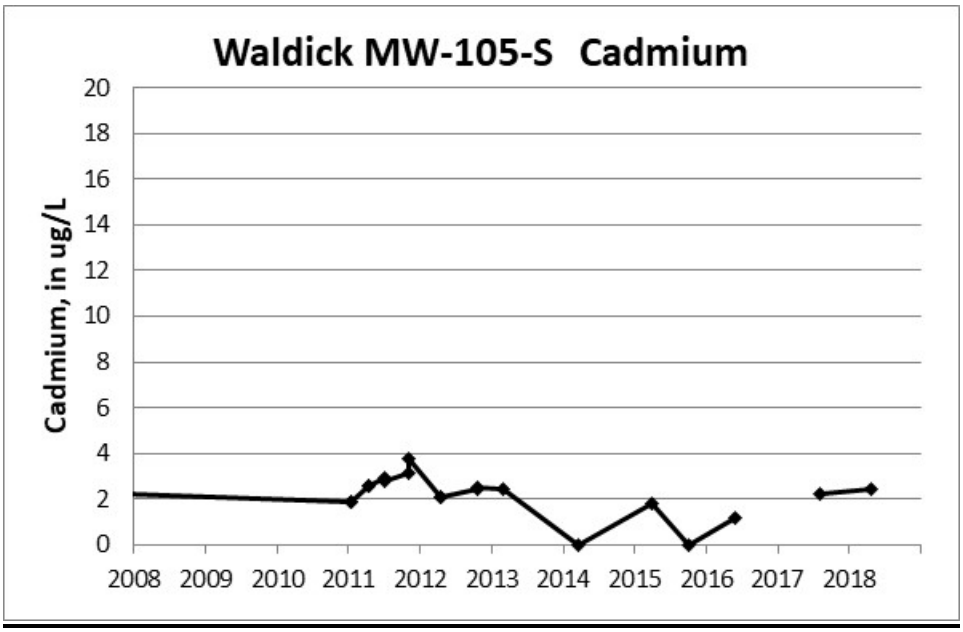
Waldick MW-105-S Cadmium
Cadmium, in ug/L
20
18
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2008
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