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THIRD FIVE-YEAR REVIEW REPORT FOR AIW FRANK/MID-COUNTY MUSTANG SUPERFUND SITE CHESTER COUNTY, PENNSYLVANIA

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MAR 15 2016

Date

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LIST OF ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
CCHD	Chester County Health Department
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethylene
DWEL	Drinking Water Equivalent Level
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
FYR	Five-Year Review
GETS	Groundwater Extraction and Treatment System
HEPR	Human Exposure Controlled and Protective Remedy in Place
IC	Institutional Control
ISCO	In-situ Chemical Oxidation
MCL	Maximum Contaminant Level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NS	Not Selected
O&M	Operation and Maintenance
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Response
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SVOC	Semi-volatile Organic Compound
SWRAU	Sitewide Ready for Anticipated Use
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethylene
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The AIW Frank/Mid-County Mustang Site (the Site) is located about 1 mile east of Exton on Business Route 30 in West Whiteland Township, Chester County, Pennsylvania. The Site consists of two adjoining properties. The AIW Frank portion of the Site is currently an open area and was historically used for the production of Styrofoam products and commercial refrigeration units. The Mid-County Mustang portion of the Site consists of an auto garage, a parking lot and a small lawn area. Operations from these two facilities contaminated soil and groundwater, primarily with trichloroethylene (TCE), a major component of solvents and degreasers. The triggering action for this five-year review (FYR) was the signing of the previous FYR on March 17, 2011.

EPA selected the remedy for the Site in a 1995 Record of Decision (ROD). All of the work required in the 1995 ROD was completed in 2000. Cleanup work was divided into three operable units (OUs). Installation of a groundwater extraction and treatment system (GETS), as well as long term monitoring (OU-1). Installation of a public water line for homes and businesses impacted by groundwater contamination (OU-2). Removal and disposal of contaminated soil and debris, as well as ecological and archeological assessments and institutional controls (ICs) (OU-3).

Following a period of successful treatment, EPA shut down the GETS in 2008. EPA completed pilot studies of in-situ chemical oxidation injections and biological remediation injections in existing and new monitoring wells. EPA completed a Focused Feasibility Study (FFS) in spring 2015 and expects to issue a decision document to modify the groundwater remedy in 2016.

The GETS is protective of human health and the environment in the short term because influent concentrations are below the Maximum Contaminant Levels (MCLs), however, the system has not been operated since 2008. In order for the OU-1 remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness: modify the remedy, update contaminants of concern (COCs) and clean-up goals, locate and sample monitoring wells that could not be found during the site inspection, install additional monitoring wells, evaluate arsenic and manganese groundwater concentrations relative to background, and complete a vapor intrusion assessment.

The water supply line has been constructed and is protective in the long term because the risk of exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply.

The removal and disposal of contaminated soil and debris, as well as ecological and archeological assessments and ICs currently protect human health and the environment in the short term. The excavation activities eliminated the risk of exposure to COCs in soils, and the ICs prevent exposure to contaminated groundwater. However, in order for the OU-3 remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness: collect soil samples around Front Building and submit for dioxin analysis.

Government Performance and Results Act (GPRA) Measure Review

As part of this FYR, the GPRA Measures have also been reviewed. The GPRA Measures and their status are provided as follows:

Environmental Indicators
Human Health: Human Exposure Controlled and Protective Remedy in Place
Groundwater Migration: Groundwater Migration under Control

Sitewide Ready for Anticipated Use (SWRAU)
The Site achieved the SWRAU Measure on June 26, 2006.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: AIW Frank/Mid-County Mustang		
EPA ID: PAD004351003		
Region: 3	**State:** PA	**City/County:** Exton/Chester County

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

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" selected above, enter Agency name:** Click here to enter text.
Author name: Greg Voigt, with additional support provided by Skeo Solutions
Author affiliation: EPA Region 3
Review period: 8/15/2015 – 3/17/2016
Date of site inspection: 9/14/2015
Type of review: Statutory
Review number: 3
Triggering action date: 3/17/2011
Due date *(five years after triggering action date)*: 3/17/2016

FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU-2 has no issues or recommendations.

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU1	Issue Category: Remedy Performance			
	Issue: The GETS no longer operates, but an alternative remedy has not been selected.			
	Recommendation: Modify the remedy in a decision document.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

OU(s): OU1	Issue Category: Remedy Performance			
	Issue: Several cleanup goals and COCs in the 1995 ROD are no longer valid			
	Recommendation: Add 1,4-dioxane as a COC and update cleanup goals in a decision document.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

OU(s): OU1	Issue Category: Monitoring			
	Issue: Sampling of additional downgradient wells is needed to ensure the full extent of the plume is defined.			
	Recommendation: Locate all monitoring wells that could not be found during the site inspection and include these wells in future sampling events. Additionally, establish a more comprehensive monitoring well network and sampling plan.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA	9/30/2017

OU(s): OU1	Issue Category: Monitoring			
	Issue: An evaluation should be conducted to determine if elevated arsenic and manganese groundwater concentrations at the Site are due to natural background conditions.			
	Recommendation: Evaluate on-Site arsenic and manganese groundwater concentrations relative to background.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	6/30/2016

OU(s): OU1	Issue Category: Remedy Performance			
	Issue: Additional investigation regarding vapor intrusion is needed.			
	Recommendation: Conduct an evaluation of vapor intrusion at the residential duplex on the Site property.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

OU(s): OU3	Issue Category: Monitoring			
	Issue: Dioxin sampling should be conducted in/around the area where the Front Building (destroyed by fire) was formerly located.			
	Recommendation: Collect soil samples around Front Building and submit for dioxin analysis.			
Affects Current Protectiveness	**Affects Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

Protectiveness Statement

Operable Unit: OU-1	*Protectiveness Determination:* Short Term Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The GETS is protective of human health and the environment in the short term because influent concentrations are below MCLs, however the system has not been operated since 2008. In order for the OU-1 remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness: modify the remedy, update contaminants of concern (COCs) and clean-up goals, locate and sample monitoring wells that could not be found during the site inspection, install additional monitoring wells, evaluate arsenic and manganese groundwater concentrations relative to background, and complete a vapor intrusion assessment.		

Operable Unit: OU-2	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The water supply line has been constructed and is protective in the long term because the risk of exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply.		

Operable Unit: OU-3	*Protectiveness Determination:* Short Term Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The removal and disposal of contaminated soil and debris, as well as ecological and archeological assessments and ICs currently protects human health and the environment in the short term. The excavation activities eliminated the risk of exposure to Site COCs in soils, and the ICs prevent exposure to contaminated groundwater. However, in order for the OU-3 remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness: collect soil samples around Front Building and submit for dioxin analysis.		

Third Five-Year Review Report
for
AIW Frank/Mid-County Mustang Superfund Site

1.0 Introduction

The purpose of a FYR is to evaluate the implementation and performance of a remedy in order to determine if the remedy is protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c) states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

EPA Region 3, with contractor support from Skeo Solutions, conducted the FYR and prepared this Report regarding the remedy implemented at the AIW Frank/Mid-County Mustang Superfund Site (the Site) in Exton, Chester County, Pennsylvania. EPA conducted this FYR from August 2015 to March 2016. EPA is the lead agency for developing and implementing the remedy for the Superfund-financed cleanup at the Site. The Pennsylvania Department of Environmental Protection (PADEP), as the support agency representing the Commonwealth of Pennsylvania, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the third FYR for the Site. The triggering action for this statutory review is the previous FYR. The FYR is required because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Pennsylvania Department of Environmental Resources (PADER) discovered volatile organic compounds (VOCs) in site groundwater.	1982
Owner of the Mid-County Mustang portion of the Site excavated three feet of soil from an area of contamination and disposed of it off site. To prevent future contamination, the owner also sealed the floor drains in the auto repair building with cement.	1984
EPA added the Site to the National Priorities List (NPL).	October 24, 1989
A fire destroyed one of the buildings on the AIW Frank property.	August 15, 1991
EPA completed the remedial investigation/feasibility study.	April 1995
EPA signed the Record of Decision.	September 29, 1995
U.S. District Court for the Eastern District of Pennsylvania entered a Consent Decree between EPA and the owner of the AIW Frank portion of the Site requiring the owner to perform the remedial action selected in the ROD for soils cleanup (OU-3).	August 5, 1998
EPA began remedial construction.	October 31, 1998
EPA designated the Site as Construction Complete; GETS begins operating.	November 8, 2000
EPA began in-situ chemical oxidation (ISCO) pilot study.	November 2005
EPA signed first FYR.	March 17, 2006
EPA injected second round of ISCO as part of pilot study.	November 2007
EPA shut down GETS due to influent concentrations below MCLs and low volume.	April 24, 2008
EPA injected third round of ISCO as part of pilot study.	September 2009
EPA began biologically-enhanced monitored natural attenuation pilot study.	March 2010
EPA signed second FYR.	March 17, 2011
Pennsylvania Department of Environmental Protection assumes Site operation and maintenance responsibilities.	December 31, 2011
EPA completed focused feasibility study for the groundwater remedy.	June 2015
EPA conducted vapor intrusion sampling at nearby residences.	December 2015

3.0 Background

3.1 Physical Characteristics

The Site is about 1 mile east of Exton on Route 30 in West Whiteland Township, Chester County, Pennsylvania (Figure 1). The Site consists of two adjoining properties, areas near or on the two properties where a municipal waterline was installed, and the areal extent of the contaminated groundwater plume (Figure 2). An on-site groundwater treatment facility was constructed as part of the remedial action.

The AIW Frank portion of the Site occupies over 15 acres. All the buildings on the AIW Frank portion of the Site have been demolished. The property is currently an open area, overgrown with mostly weeds and a large crushed stone/concrete pile remaining from the building demolition. The Mid-County Mustang portion of the Site is less than 1 acre and consists of an auto garage, a parking lot and a small lawn area.

The local aquifer is formed by the Conestoga Limestone and the Ledger Dolomite. Groundwater migration through these formations is through fractures and solution channels and along bedding planes within the rock mass. The Site lies on a subdued topographic ridge that slopes gently to the west. On the northern flank of this ridge, groundwater flows to the northwest, and on the southern flank, groundwater flows to the west-southwest. Groundwater potentiometric surfaces indicate that the groundwater flow is consistent with the topography of the area.

West Valley Creek flows east to west through the northernmost portion of the property, just south of a walking path. Before EPA involvement, the creek was impounded on the property to form a pond measuring about 310 feet by 60 feet (0.4 acres). The EPA groundwater treatment plant discharged treated groundwater into this pond. From the pond, discharge flows into West Valley Creek or is used for spray irrigation of the adjoining county and township park property.

3.2 Land and Resource Use

Land use in the area is commercial, industrial and residential. No structures remain at the AIW Frank portion of the Site. Corbo Automotive Services operates at the former Mid-County Mustang portion of the Site. The Site is next to a private single-family rental residence to the east; the Stauffer Landscaping building to the north; another private duplex rental residence to the west; and a small open field, the old Meridian Bank building, and Route 30 to the south.

Before implementation of EPA's remedial actions, some residences and businesses located over the contaminant plume had private wells that were used for drinking water. Three vacant and boarded homes are located immediately west of the Site, over the groundwater plume. These and other downgradient homes have been connected to public water.

3.3 History of Contamination

From 1962 to 1981, the AIW Frank portion of the Site housed a facility where Styrofoam and commercial refrigeration units were made. Solvents were used to degrease the equipment. It is

believed that solvents were used to degrease the equipment used to manufacture the Styrofoam products and that the used solvents were at times poured into an open floor drain in the Front Building instead of taking them outside to the used solvent storage tank. This floor drain is thought to be a potential source of groundwater contamination because it was located in the area of highest groundwater contamination. Two large storage tanks, one for clean solvents and one for used solvents, were located just to the east of the Front Building. It is believed that mishandling of the solvents in this storage tank area led to the soil contamination found in this area and also contributed to the groundwater plume.

Beginning in the 1940s, Mid-County Mustang operated an auto repair and auto body garage. EPA believes solvents were routinely dumped into floor drains until the 1980s, when the drains were sealed. From the floor drains, the solvents flowed to a tile drain field where they contaminated soil and groundwater. The primary contaminant is trichloroethylene (TCE), a major component of solvents and degreasers.

In 1982, PADER (now PADEP) sampled local private water supply wells and found elevated concentrations of VOCs associated with solvents, including TCE, tetrachloroethylene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA).

3.4 Initial Response

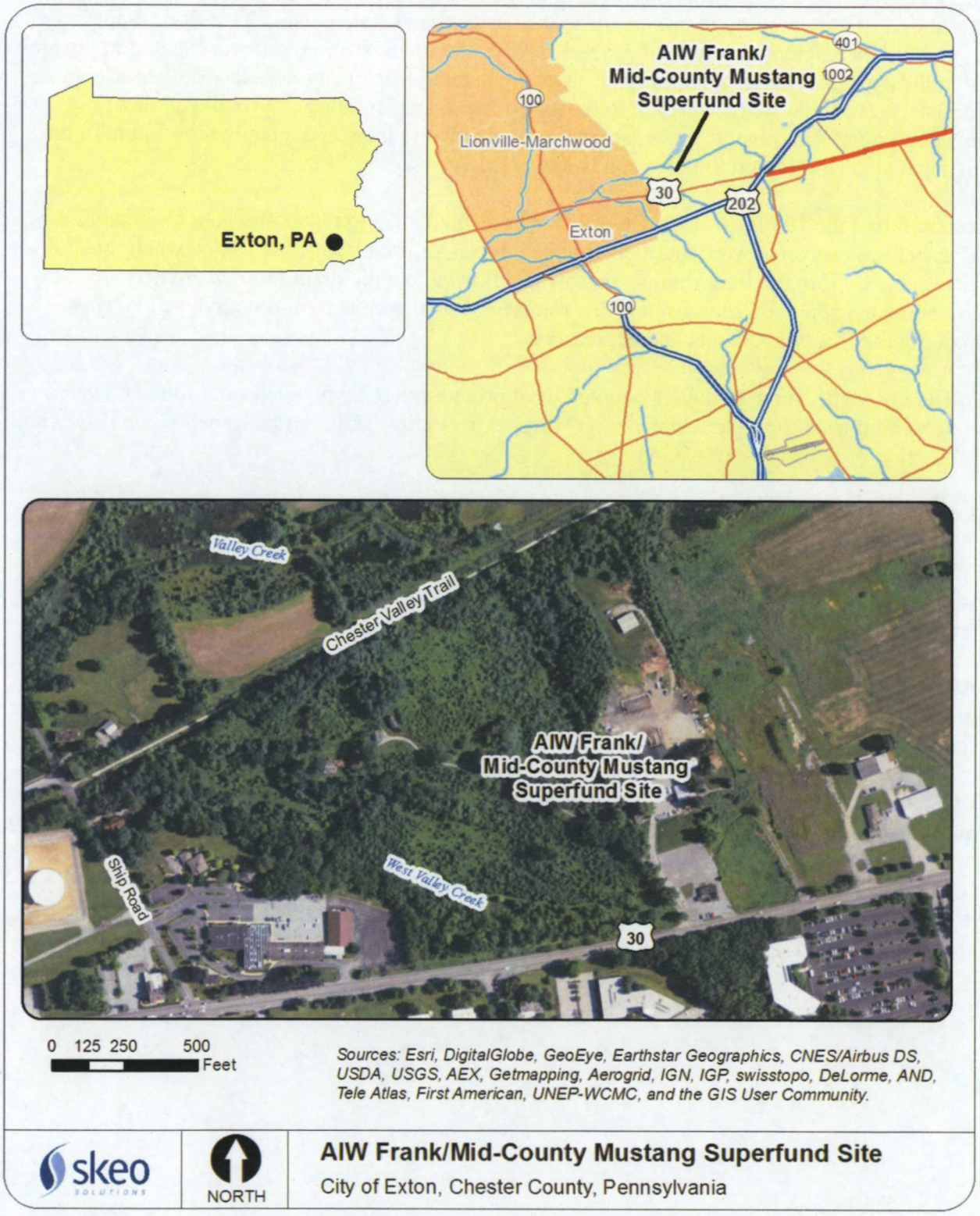
Analytical results for groundwater and soil samples collected between 1982 and 1984 revealed various VOCs. Potentially contaminated residential wells were fitted with carbon filters to temporarily remove the VOCs from drinking water sources.

As a result of a 1984 investigation conducted by the owners of the Mid-County Mustang property, PADER oversaw excavation of 3 feet of solvent-contaminated soil from the drainage field and the sealing of the floor drains in the garage areas to prevent future contamination.

EPA conducted an investigation of the property in 1985 that found elevated levels of TCE, PCE and 1,1,1-TCA in the soil and groundwater. The Site was listed on the NPL on October 24, 1989.

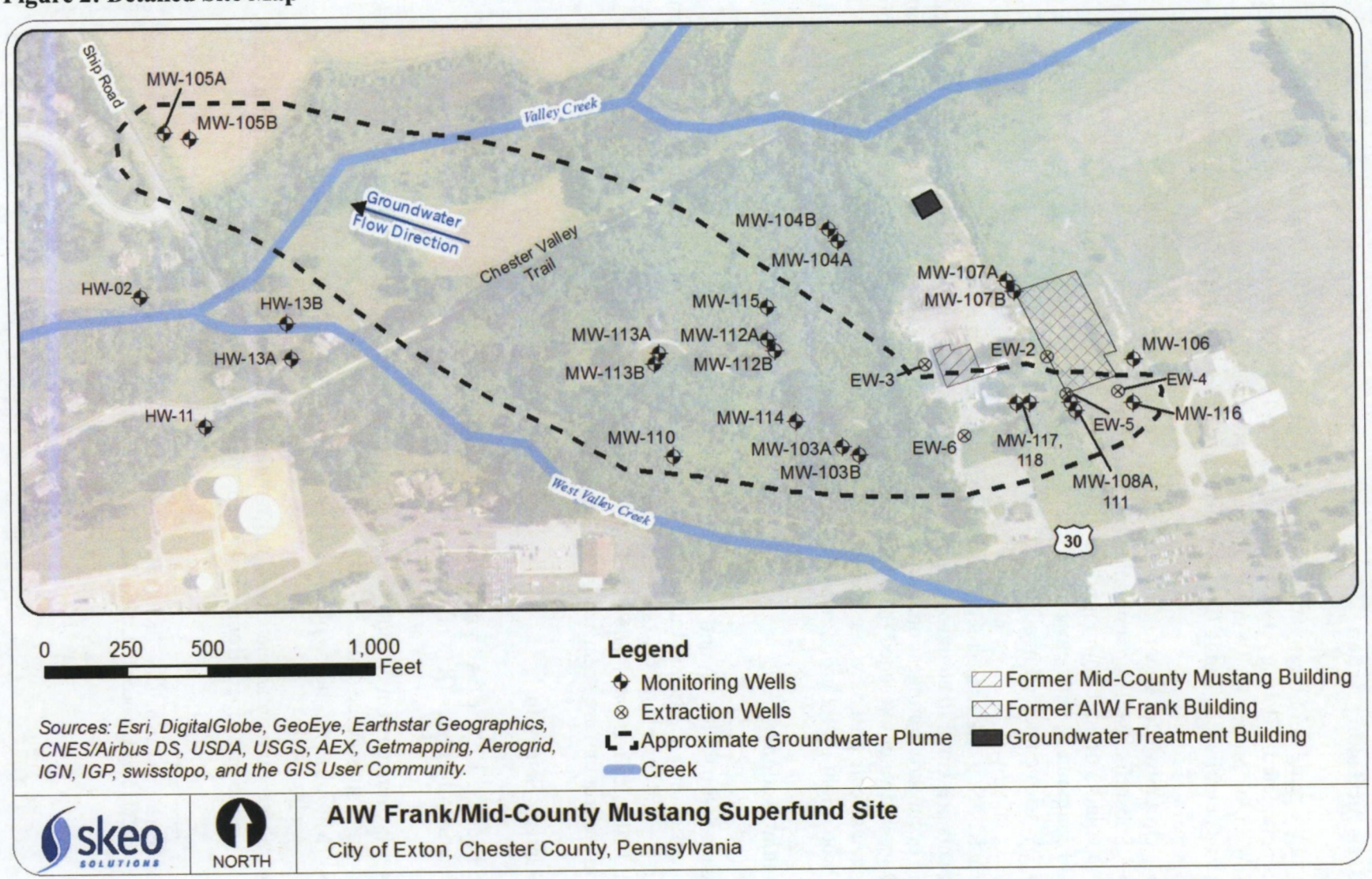
In the fall of 1990, the owner of the AIW Frank property removed and disposed of about 30 drums of hazardous substances generated on Site. The drums contained mostly methylene chloride and were disposed of under PADER oversight.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.5 Basis for Taking Action

EPA began the remedial investigation and feasibility study (RI/FS) in January 1991 and field work was completed in January 1993. On August 15, 1991, a fire destroyed the Front Building on the AIW Frank property.[1] To ensure the safety of employees conducting field work the building was demolished. The RI/FS identified three types of significant contamination:

- Groundwater contamination by chlorinated and non-chlorinated VOCs.
- Subsurface soil contamination by various organic compounds including VOCs, semi-volatile organic compounds (SVOCs), pesticide/polychlorinated biphenyl (PCB) compounds, and heavy metals.
- Wastes contained in abandoned debris, underground tanks, drums and a sump.

During the RI/FS, a risk assessment was performed to determine the level of risk the contaminants presented to an individual in various scenarios. The potential carcinogenic affects that could occur through ingestion, dermal contact and/or inhalation of vapors during showering with Site groundwater exceeded the upper end of EPA's target risk range. Additionally the non-carcinogenic affects posed by Site contaminants exceeded EPA's targets, particularly for children who might ingest groundwater or have dermal contact with subsurface soils.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP.

4.1 Remedy Selection

On September 29, 1995, EPA signed a ROD documenting the remedial actions for the Site. The remedial action objectives (RAOs) are to:

- Prevent current or future human exposure to contaminants in the groundwater, soils and subsurface soils;
- Minimize migration of contaminated groundwater and to restore groundwater to MCLs; and
- Protect uncontaminated groundwater and surface water for current and future use, and to protect environmental receptors.

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[1] Dioxin can be generated in building fires. Since EPA never conducted soil sampling for dioxin in/around the area where the Front Building fire occurred, dioxin sampling is recommended.

The remedial actions selected in the 1995 ROD include:

- Provision of point-of-use carbon filtration units (for residents at risk until waterline is extended);
- Installation of a waterline and service connections;
- Performance of a Phase I archaeological survey before any intrusive remedial activities;
- Excavation and off-site disposal of contaminated soils;
- Removal, decontamination and off-site disposal of drums and sump;
- Structure demolition or restoration;
- Institutional controls to prevent the consumption of contaminated groundwater and creation of any hydraulically adverse influence on the extraction system operation;
- Performance of an Additional Ecological Assessment;
- Extraction and treatment via air stripping of groundwater until MCLs are met; and
- Long term groundwater monitoring.

Groundwater and soil cleanup goals identified in the 1995 ROD are presented in Table 2. Safe Drinking Water Act MCLs were used as the groundwater cleanup goals. The soil cleanup goals are site-specific risk-based goals.

Table 2: Groundwater and Soil Cleanup Goals from 1995 ROD

Groundwater Contaminant of Concern	Groundwater Cleanup Goal (µg/L)[a]	Soil Cleanup Goal (mg/kg)[b]
TCE	5	2,000
1,1,1-TCA	200	1,000
1,1-dichloroethylene (DCE)	7	1,000
1,1-dichloroethane (DCA)	81	500
1,1,2-trichloroethane	5	Not Selected (NS)
cis-1,2-dichloroethene	70	NS
1,2-dichloropropane	5	NS
PCE	5	2,000
Vinyl chloride	2	NS
Toluene	1,000	NS
Chloroform (total trihalomethanes)	100	NS
Arsenic	50	NS
Manganese	80[c]	NS

a. Micrograms per liter
b. Based on protection of groundwater
c. Secondary MCL for aesthetic considerations (i.e., odor, color, taste)

4.2 Remedy Implementation

EPA divided implementation of the cleanup into three OUs. OU-1 included installation of a GETS, as well as long term monitoring. OU-2 included the installation of a public water line for homes impacted by groundwater contamination. OU-3 included removal and disposal of contaminated soil and debris, as well as ecological and archeological assessments and ICs.

Operable Unit 1

Construction of the GETS was completed in November 2000. The GETS operated until April 2008 when it was turned off and since then has been maintained in operational condition. After evaluation of the 2008 semiannual groundwater sampling results, it was determined that operation of the GETS was having minimal impact on the dissolved plume. When operated, the GETS consisted of a tray aerator designed for VOC removal with vapor phase carbon treatment of the off-gas followed by liquid phase carbon polishing prior to discharge. The ROD also required construction of a spray irrigation discharge system for the adjoining Township and County park property, which was designed and built as an option for utilizing the water discharged from the GETS into the on-site pond. West Whiteland Township assumed all responsibility for the operation and maintenance (O&M) of the spray irrigation system.

Due to the fact that the performance of the GETS decreased as contaminant concentrations in groundwater were reduced, EPA conducted three pilot studies between 2005 and 2009 to determine if the groundwater could be treated using ISCO to oxidize the contaminants. EPA tested potassium permanganate and sodium permanganate oxidants by injecting them through select wells into the groundwater. Post-injection sampling confirmed that both oxidants were able to reduce groundwater contamination and could be used as a viable option for future treatment.

EPA conducted two additional pilot studies in 2010 and 2011 to determine if the groundwater could be treated using in-situ enhanced bioremediation. EPA tested ABC® (a patented mixture of lactates, fatty acids, and a phosphate buffer) and LactOil® (a self-emulsifying vegetable oil) by injecting them through select wells into the groundwater. Both amendments were able to reduce groundwater contamination and could be used as a viable option for future treatment.
Figures 3 and 4 show TCE concentrations observed in the shallow wells and intermediate/deep wells, respectively, from data collected in November 2013.

Based on the positive results of the ISCO and bioremediation pilot studies, EPA completed a FFS in 2015 to determine whether it would be beneficial to amend the groundwater remedy specified in the 1995 ROD. When compared to the existing extraction and treatment remedy, the FFS states that a remedy which included ISCO and bioremediation technologies would require less time and less money to achieve clean-up goals. Based on this information, EPA expects to modify the groundwater remedy in 2016.

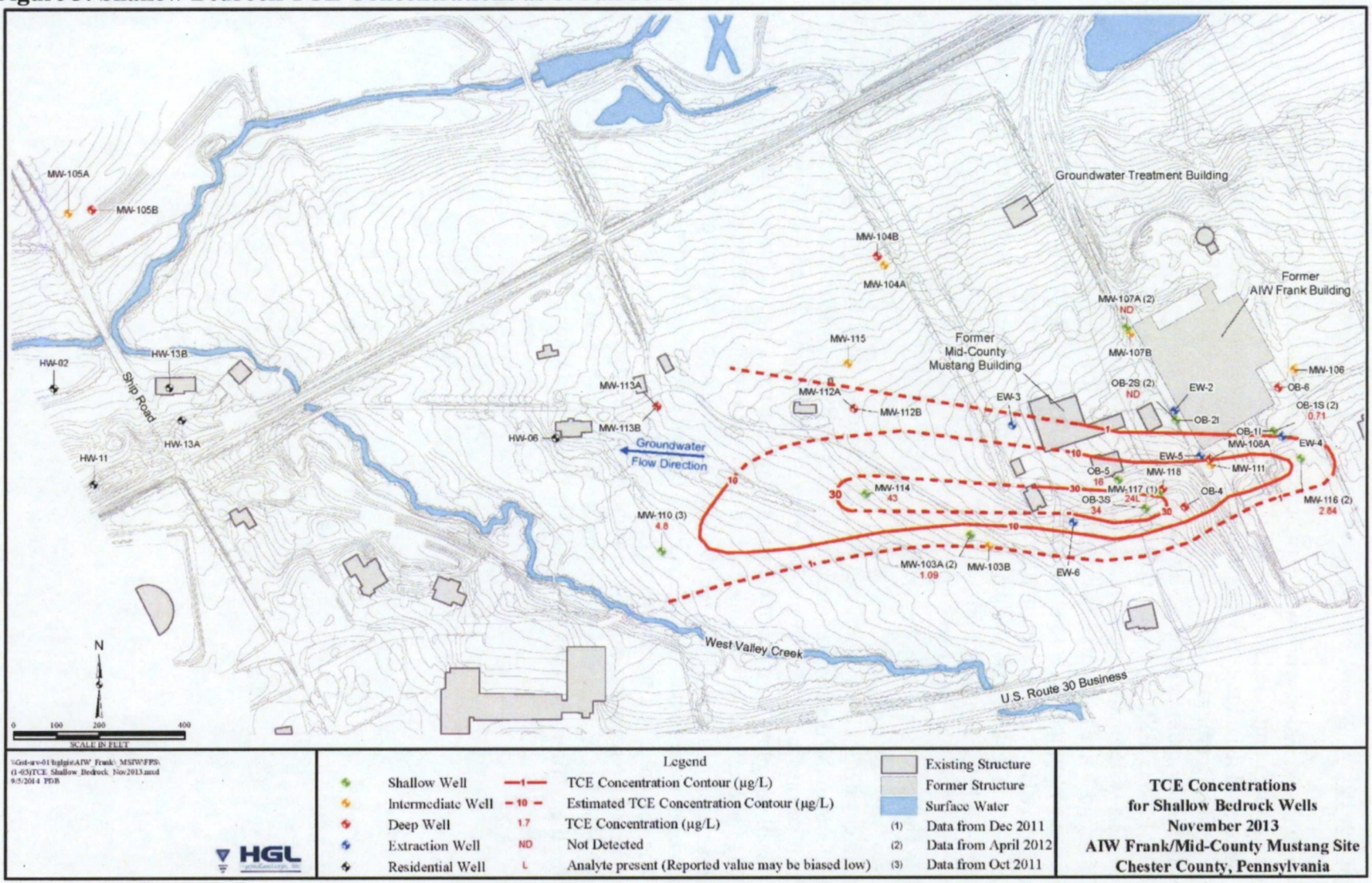
Operable Unit 2

The water main extension work was completed in June 2000. The waterline design and construction were completed in two stages. The first stage extended the water main and the second stage established the service connections. Philadelphia Suburban Water Company (PSWC), through a contract with U.S. Army Corps of Engineers (USACE), designed and installed the water main extension. Ownership of the extended water supply pipelines was assumed by PSWC. PSWC also accepted responsibility for all future O&M of the water main extension. The water main extension included 5,483 feet of ductile iron water pipeline, 13 service taps and 4 fire hydrants. It also included either the disconnection of the old supply wells or the conversion of the wells to strictly non-consumptive outside use in compliance with Chester County Health Department regulations. In all cases, the well supply was disconnected from the in-home distribution system. In two instances, residential wells were converted to monitoring wells for annual sampling.

Operable Unit 3

Soil was excavated in the former above ground storage tank area of the AIW Frank portion of the Site. To clean up the deeper contamination, soils were excavated to the bedrock in some locations if subsurface soil TCA performance standards listed in the ROD were not met. Bottom and side wall sampling confirmed clean-up standards prior to backfilling. The contaminated soils were placed in lined roll-off containers and disposed off-site in accordance with the ROD. Drums that remained in the Rear Building were over-packed and sent off-site for disposal. A sump adjacent to the foundation of the Front Building contained sediments contaminated with PCBs. The contaminated sediments were removed and the sump was cleaned. The Rear Building was demolished. No ecological risk or archeological artifacts were identified at the Site. Completion of this work allowed for unrestricted use of the AIW Frank portion of the Site, except for the institutional controls related to the groundwater portion of the remedy.

Figure 3: Shallow Bedrock TCE Concentrations as of Fall 2013



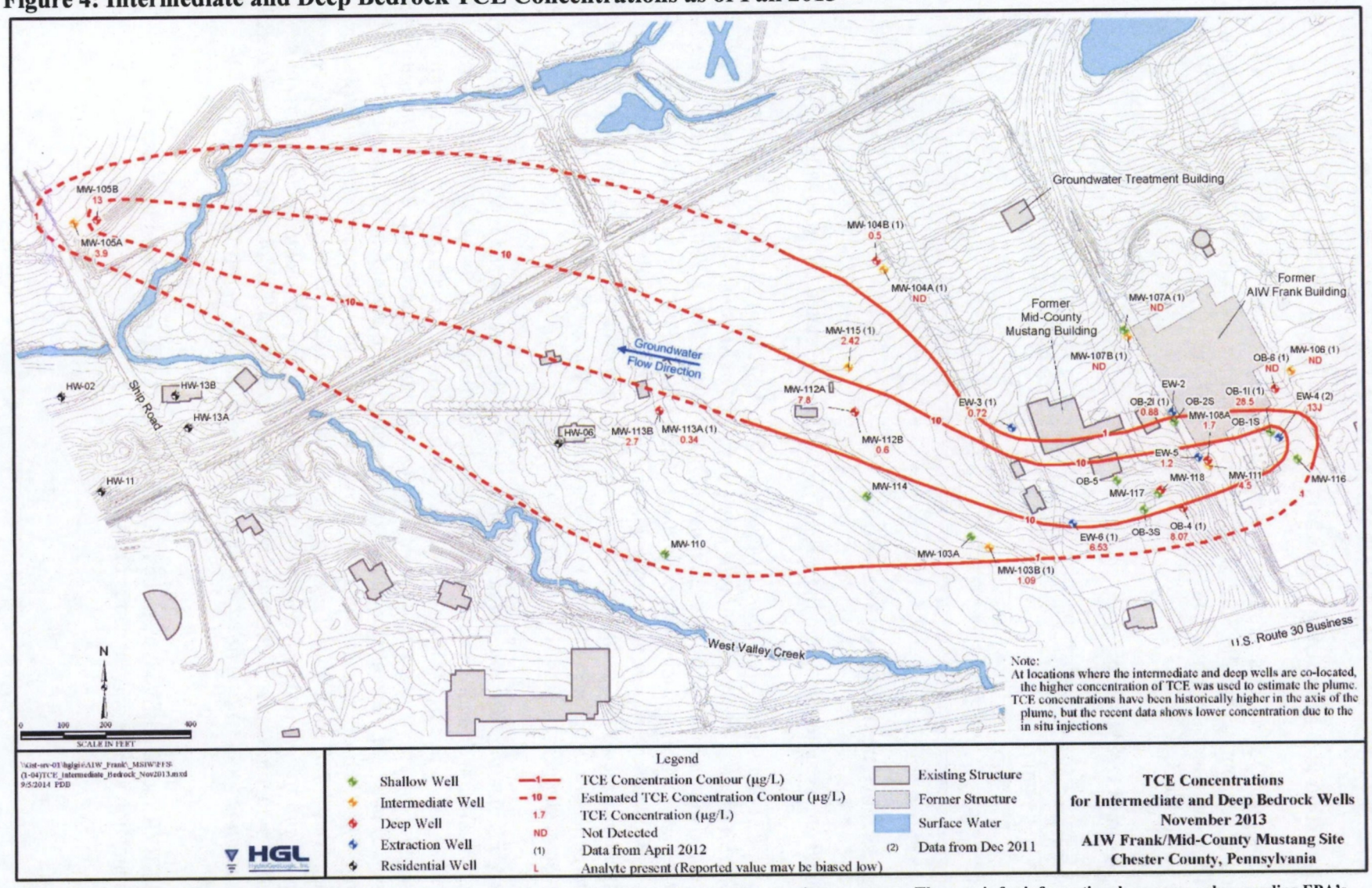
Legend

Shallow Well	—1—	TCE Concentration Contour (µg/L)	Existing Structure
Intermediate Well	– 10 –	Estimated TCE Concentration Contour (µg/L)	Former Structure
Deep Well	1.7	TCE Concentration (µg/L)	Surface Water
Extraction Well	ND	Not Detected	(1) Data from Dec 2011
Residential Well	L	Analyte present (Reported value may be biased low)	(2) Data from April 2012
			(3) Data from Oct 2011

TCE Concentrations for Shallow Bedrock Wells November 2013 AIW Frank/Mid-County Mustang Site Chester County, Pennsylvania

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 4: Intermediate and Deep Bedrock TCE Concentrations as of Fall 2013



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

4.3 Operation and Maintenance (O&M)

PADEP took over O&M of the groundwater remediation system in 2011 in accordance with the Superfund State Contract for the Site. Since shutdown of the system in 2008, the only O&M activity is groundwater sampling. O&M costs from Fiscal Year (FY) 2011 through FY 2014 are presented in Table 3.

Table 3: Annual O&M Costs

Year	Total Cost
FY 2011	$29,000
FY 2012	$35,000
FY 2013	$22,000
FY 2014	$2,000

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2011 FYR for the Site stated the following:

The assessment during this five-year review found that the remedy at the Site is protective of human health and the environment in the short term. The most immediate risk of exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply, which was completed in September 2000. Institutional controls are in place, which currently prevent new residential wells from being installed in the contaminant plume. Contaminated soils, sediments and drums were also excavated and removed in 1998. Clean-up goals are being met in some wells; however, they must still be met throughout the groundwater plume.

The remedy is meeting the remedial action objectives as intended by the 1995 ROD. However, EPA and the State will address several issues identified during this five-year review in order for the Site to be protective in the long term. Based on the positive results of the in-situ chemical oxidation pilot injections, a reevaluation of the remedy may be warranted. Also, although vapor intrusion (VI) does not currently appear to be occurring, some additional VI sampling should be conducted. The 1,4 dioxane concentrations in on-site wells have decreased significantly since 2003, however, 1,4 dioxane is still present and it should be added as a contaminant of concern through an appropriate decision document. An evaluation should be conducted to determine if arsenic and manganese are background related. The change in MCL for chloroform and arsenic, if it is determined to be Site related, should be addressed as part of any decision document modification.

The 2011 FYR included five issues and recommendations. This report summarizes each recommendation and its current status below.

Table 4: Progress on Recommendations from the 2011 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
An evaluation of existing data and pilot study results will be conducted in consultation with PADEP and a remedy change implemented, if appropriate.	EPA	6/30/2012	EPA completed a FFS in June 2015 and expects to modify the OU1 remedy in a 2016 decision document.	June, 2015
Conduct additional residential vapor intrusion sampling.	EPA	6/30/2015	EPA conducted vapor intrusion sampling and is currently waiting for sampling results.	December, 2015
Modify remedy to add 1,4-dioxane as contaminant of concern.	EPA	6/30/2012	EPA intends to add 1,4-dioxane as a contaminant of concern in a 2016 decision document.	NA
Modify remedy to change performance standards for chloroform, and arsenic if it is determined to be site related, to current MCL.	EPA	6/30/2012	EPA intends to change performance standards as needed in a 2016 decision document.	NA
Conduct evaluation of arsenic and manganese relative to background.	EPA	6/30/2012	EPA plans to conduct an evaluation of arsenic and manganese in 2016	NA

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 3 initiated the FYR in August 2015 and scheduled its completion for March 2016. EPA remedial project manager (RPM) Greg Voigt led the EPA site review team, which also included EPA site attorney Robert Hasson, EPA community involvement coordinator Carrie Deitzel and contractor support provided to EPA by Skeo Solutions. In August 2015, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The established review schedule consisted of the following activities:

- Community notification;
- Document review;
- Data collection and review;
- Site inspection;
- Local interviews; and
- FYR Report development and review.

6.2 Community Involvement

In November 2015, EPA published a public notice in the Daily Local newspaper announcing the commencement of the FYR process for the Site, providing contact information for Carrie Deitzel and inviting community participation. The press notice is available in Appendix A. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. EPA will place copies of the document in the designated Site repository and on EPA's webpage for the Site.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the ROD, FFS and recent monitoring data. Appendix B includes a complete list of the documents reviewed.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

The ROD identified cleanup goals for the groundwater COCs based on federal MCLs. In the absence of an MCL, which is the case for 1,1-DCA, the ROD selected a risk-based cleanup goal. This FYR compared the federal MCLs listed in the ROD to the current National Primary Drinking Water Regulations (40 CFR 141-143). As shown in Table 5, the MCLs and risk-based clean-up goals for 1,1-DCA, chloroform, arsenic, and manganese have changed. The updated MCLs for these COCs will be incorporated into a future decision document.

Table 5: Groundwater ARARs Review

Groundwater COC	1995 ROD Groundwater Cleanup Goal (µg/L)	2015 ARARs[a]	ARARs Change
TCE	5	5	No Change
1,1,1-TCA	200	200	No Change
1,1-DCE	7	7	No Change
1,1-DCA	81	2.7[b]	More Stringent
1,1,2-trichloroethane	5	5	No Change
cis-1,2-dichloroethene	70	70	No Change
1,2-dichloropropane	5	5	No Change
PCE	5	5	No Change
Vinyl chloride	2	2	No Change
Toluene	1,000	1,000	No Change
Chloroform (total trihalomethanes)	100	80	More Stringent
Arsenic	50	10	More Stringent
Manganese	80	430[b]	Less Stringent

a. Federal MCLs
b. June 2015 Tap Water Regional Screening Level

Institutional Control Review

Skeo Solutions staff conducted research at the Chester County Public Records Office online and found the deed information pertaining to the Site listed in Table 6.

Table 6: Deed Documents from Chester County Public Records Office

Date	Type of Document	Description	Book #	Page #
6/21/2007	Deed	Property deed for former AIW Frank property Includes acknowledgement of historical soil and groundwater contamination	7194	2280
3/20/2012	Deed	Former Mid-County Mustang property Includes acknowledgement of historical soil and groundwater contamination	8383	1370

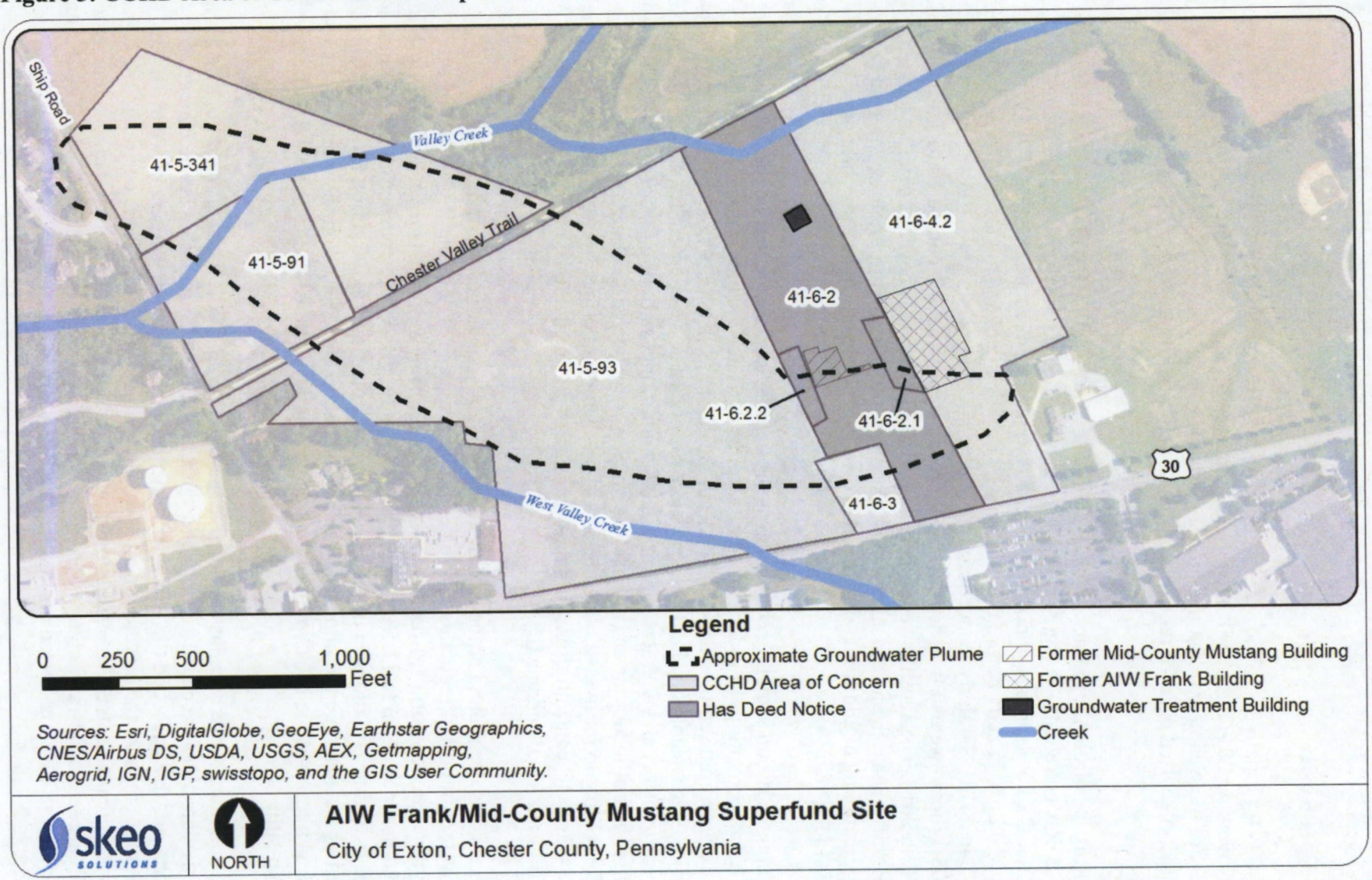
The ROD requires institutional controls to prevent consumption of contaminated groundwater and to prevent adverse impacts on the operation of the extraction system. The ROD's prohibitions on wells are currently being met by regulations promulgated and enforced by the

Chester County Health Department (CCHD). According to CCHD Rules and Regulations, Section 501.15 (Groundwater Areas of Concern), installation of a new well in the vicinity of an NPL site requires CCHD to contact and receive prior approval of EPA. Areas of Concern also require initial sampling of the well water to demonstrate that it meets the drinking water standards before permission from the CCHD is granted to use the new supply well for drinking purposes. EPA has provided CCHD with base maps of the Site and supplies site plume information on a biannual basis to assist CCHD in implementing their regulations. Table 7 lists the institutional controls associated with the impacted parcels at the Site. The CCHD Area of Concern for the Site is shown in Figure 5.

Table 7: Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place	Notes
Groundwater	Yes	Yes	Not specified – determined on a permit basis	Restrict installation of groundwater wells	The Site is designated an Area of Concern by the CCHD, which restricts well placement.	
Soil and Groundwater	No	No	41-6-2 41-6-2.1 41-6-2.2	Inform property owner of historical contamination	Deed acknowledgement	This is an informational IC only and does not place restrictions on the property. It was added to the deed as required by PADEP.

Figure 5: CCHD Area of Concern Base Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

During this FYR period, groundwater sampling occurred at various wells in May 2011, April 2012, November 2013 and April 2014 in accordance with the O&M plan. Figure 6 provides an overview of the well network at the site. Some wells were not chosen for sampling or could not be located. A revised plan for regular sampling of all monitoring wells or a subset of wells is necessary.

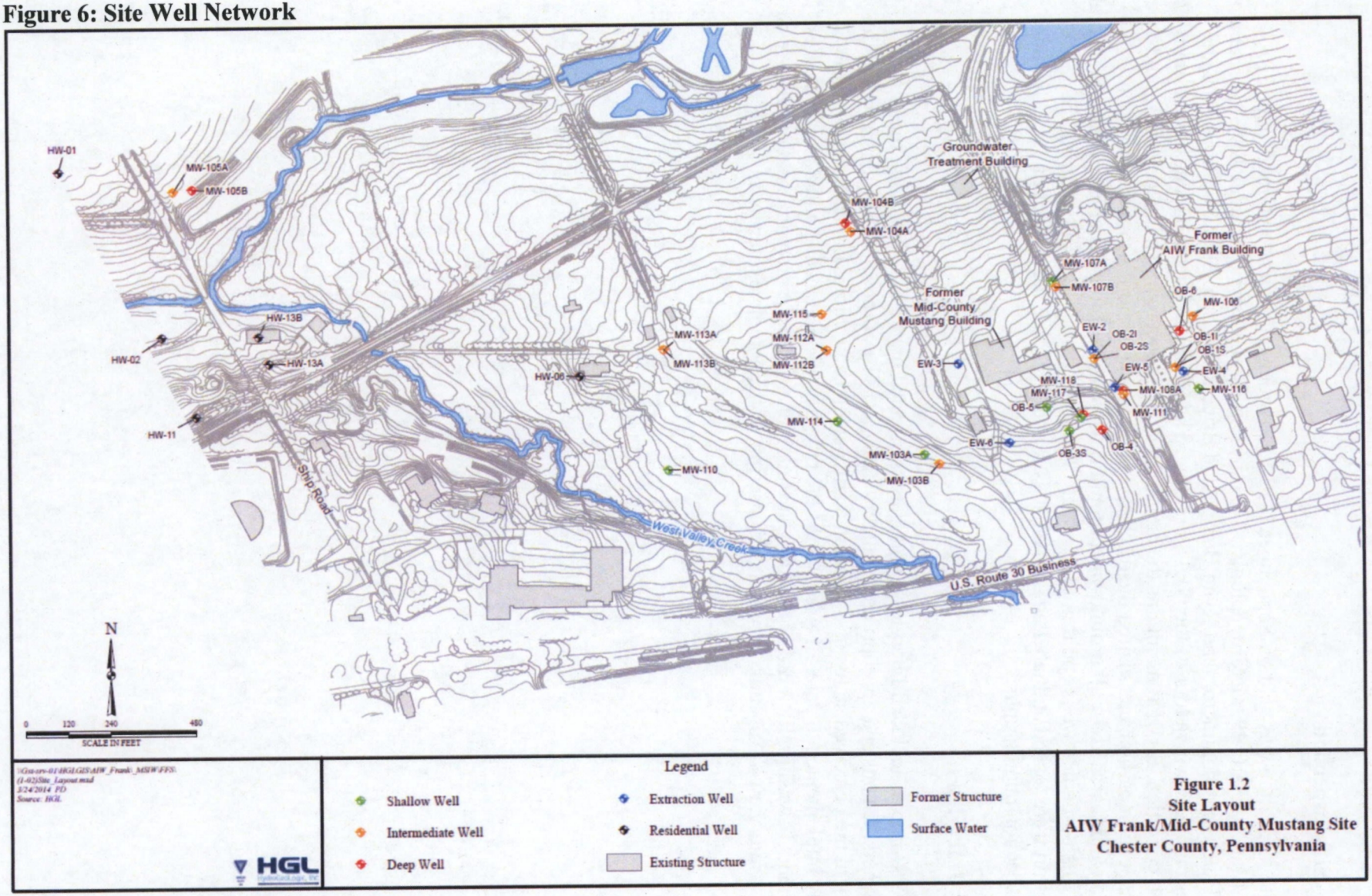
Monitoring data from the extraction wells, source area wells, and downgradient wells indicate that TCE concentrations are significantly less than before the remedy was implemented (Appendix C). For example, concentrations of TCE in the source area well MW-111 were as high as 210 µg/L in 2005 before the injections. After the injections the level of TCE decreased to 1.4 µg/L in 2014. Similarly, concentrations in downgradient wells MW-105A (shallow) and MW-105B (deep) were at 8 µg/L and 18 µg/L respectively in 2005, compared to 2.8 µg/L and 4.4 µg/L in 2014. These wells were not sampled in 2015 because they could not be located by PADEP staff. Given the fact that large portions of the downgradient plume are inferred (Figures 3 and 4), sampling of additional downgradient wells is needed to ensure the full extent of the plume is identified.

2011 Vapor Intrusion sampling conducted at a residential duplex located on the Site indicated that VOC concentrations in indoor air were within EPA's acceptable levels, however VOC concentrations from samples collected beneath the concrete slab on both sides of the duplex were above EPA's acceptable levels. Based on these results, EPA determined that Vapor Intrusion did not appear to be occurring, but recommended that additional sampling be conducted. Therefore, a second round of indoor air and sub-slab samples were collected in December 2015. EPA is currently waiting to receive validated results of this sampling effort, however preliminary results indicate that VOC concentrations in indoor air remain at acceptable levels, while sub-slab concentrations remain elevated.

1,4-dioxane has been found at the Site in the most highly contaminated portion of the groundwater plume, but reductions have been achieved as a result of the ISCO pilot injections. For example, pre-injection 1,4-dioxane levels in monitoring well OB-1I measured 160 µg/L in 2003, but dropped down to 11.5 µg/L in 2014 (Appendix C). While concentrations continue to decrease over time, 1,4 dioxane is still present at concentrations above action levels and should be added as a contaminant of concern in a decision document. Based on the reduction of 1,4-dioxane as a result of the ISCO pilot injections, it is believed that 1,4-dioxane can be effectively treated in-situ.

Arsenic and manganese were last sampled at the Site in May 2011. During that sampling event, no arsenic detections exceeded 10 µg/L (the current MCL). Manganese was detected at concentrations that exceeded the ROD performance standard which is a secondary MCL for taste/odor, but most of the elevated manganese detections were in the areas where the ISCO injections were conducted. An evaluation should be conducted to determine if elevated arsenic and manganese groundwater concentrations at the Site are due to natural background conditions. Data for all Site COCs collected during the past five years is included in Appendix C.

Figure 6: Site Well Network



\\Gis-srv-01\HGLGIS\AIW_Frank_MSIW\FFS\
(1-02)Site_Layout.mxd
3/24/2014 PD
Source: HGL

HGL

Legend

- Shallow Well
- Intermediate Well
- Deep Well
- Extraction Well
- Residential Well
- Existing Structure
- Former Structure
- Surface Water

Figure 1.2
Site Layout
AIW Frank/Mid-County Mustang Site
Chester County, Pennsylvania

6.5 Site Inspection

The site inspection was held on September 14, 2015. Participants included Greg Voigt, EPA RPM; Mark Leipart, EPA hydrogeologist; Timothy Cherry and David Ewald, PADEP; Jonathan Rihs, HGL, EPA contractor; and Ryan Burdge and Brice Robertson, Skeo Solutions. The site inspection began with a tour of the GETS building. The GETS no longer operates, but it remains in good condition. PADEP maintains the building, which is secured by a locked chain link fence. Site inspection participants visited the discharge point to a pond north from the treatment building and searched for all groundwater monitoring wells. Due to extensive vegetation, several of the flush-mounted wells could not be located. The wells that were located during the inspection were locked and labelled. Appendices D and E include the inspection checklist and site inspection photographs.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners, tenants and appropriate regulatory agencies. The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the remedy implemented to date. EPA contacted the property owner, tenants, and officials at West Whiteland Township. EPA did not identify any additional issues or recommendations as a result of these interviews. Appendix F provides transcripts of the complete interviews.

7.0 Technical Assessment

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

Yes, the remedies were constructed in accordance with the 1995 ROD and function as intended. The GETS has not been operating since April 2008 while ISCO and bio-remediation pilot studies have been conducted. Contaminant levels in on-site wells have decreased overall since 2005 and decreased significantly in source area wells as a result of the pilot study injections. TCE levels in some wells have been reduced to levels below the cleanup standards required by the 1995 ROD. However, the full extent of the TCE plume may not be delineated. Given the fact that large portions of the downgradient plume are inferred (Figures 3 and 4), sampling of additional downgradient wells is needed to ensure the full extent of the plume is identified. An alternative remedial approach to achieve the groundwater restoration RAO, such as in-situ injections, is needed in a future decision document.

The immediate threats have been addressed, and the remedies are protective. Exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply. Institutional controls are in place that currently prevent new residential wells from being installed in the contaminant plume. Soil excavation and disposal, drum and sump removal and disposal, structure demolition and restoration, ecological assessment, and an archeological assessment were all completed and met the objectives of the 1995 ROD.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of remedy selection still valid?

Some of the groundwater cleanup levels are no longer valid, because the MCLs have been revised. EPA intends to modify the groundwater remedy and accordingly will evaluate if groundwater cleanup goals need to be modified. As a result of sampling the groundwater plume 1,4-dioxane was detected at concentrations above action levels and in a future decision document will be added as a contaminant of concern. No modifications to the RAOs are needed.

The potential for vapor intrusion is being further evaluated by EPA. Vapor intrusion samples were collected in December 2015 and EPA is waiting on the results. Preliminary results indicate that VOC concentrations in indoor air remain at acceptable levels, while sub-slab concentrations remain elevated. After this assessment is completed, EPA will determine if actions are needed to address any exposure pathways.

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

The fire that occurred in the Front Building presents the potential for soil contamination from dioxin. Since EPA never conducted soil sampling for dioxin in/around the area where the Front Building fire occurred, dioxin sampling is recommended. No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The remedies were constructed in accordance with the 1995 ROD and function as intended. Contaminant levels in on-site wells have decreased overall since 2005 and decreased significantly in source area wells as a result of pilot study injections. Exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply. Institutional controls are in place that currently prevent new residential wells from being installed in the contaminant plume. However, the GETS selected in the ROD has not been operating since 2008 and an alternative remedy has not been selected. EPA has completed a FFS and expects to modify the remedy in 2016. The modification will also update groundwater monitoring requirements, COCs, and cleanup goals, as needed. The potential for vapor intrusion exists and is being evaluated by EPA. After the assessment is completed, EPA will determine if actions are needed to address any exposure pathways. Dioxin sampling is needed in/around the area where the Front Building fire occurred. EPA will also conduct an evaluation of Site arsenic and manganese as recommended in the last FYR to determine the extent of natural background conditions.

8.0 Issues

Table 8 summarizes the current site issues.

Table 8: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
The GETS no longer operates, but an alternative remedy has not been selected.	No	Yes
Several cleanup goals and COCs in the 1995 ROD are no longer valid.	No	Yes
Sampling of additional wells is needed to ensure the full extent of the plume is defined.	No	Yes
An evaluation should be conducted to determine if elevated arsenic and manganese groundwater concentrations at the Site are due to natural background conditions.	No	Yes
Additional investigation regarding vapor intrusion is needed.	No	Yes
Dioxin sampling should be conducted in/around the area where the Front Building (destroyed by fire) was formerly located.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 9 provides recommendations to address the current site issues.

Table 9: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The GETS no longer operates, but an alternative remedy has not been selected.	Modify the remedy in a decision document.	EPA	EPA	9/30/2016	No	Yes
Several cleanup goals and COCs in the 1995 ROD are no longer valid.	Add 1,4-dioxane as a COC and update cleanup goals in a decision document.	EPA	EPA	9/30/2016	No	Yes
Sampling of additional wells is needed to ensure the full extent of the plume is defined.	Locate all monitoring wells that could not be found during the site inspection and include these wells in future sampling events. Additionally, establish a more comprehensive monitoring well network and sampling plan.	State & EPA	EPA	9/30/2017	No	Yes
An evaluation should be conducted to determine if elevated arsenic and manganese groundwater concentrations at the Site are due to natural background conditions.	Evaluate on-Site arsenic and manganese groundwater concentrations relative to background.	EPA	State	6/30/2017	No	Yes
Additional investigation regarding vapor intrusion is needed.	Conduct an evaluation of vapor intrusion at the residential duplex on the Site property.	EPA	EPA	9/30/2016	No	Yes
Dioxin sampling should be conducted in/around the area where the Front Building (destroyed by fire) was formerly located.	Collect soil samples around Front Building and submit for dioxin analysis.	EPA	EPA	9/30/2016	No	Yes

10.0 Protectiveness Statements

The GETS is protective of human health and the environment in the short term because influent concentrations are below MCLs, however, the system has not been operated since 2008. In order for the OU-1 remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness: modify the remedy, update COCs and clean-up goals, locate and sample monitoring wells that could not be found during the site inspection, install additional monitoring wells, evaluate arsenic and manganese groundwater concentrations relative to background, and complete a vapor intrusion assessment.

The water supply line has been constructed and is protective in the long term because the risk of exposure to contaminated groundwater has been eliminated by the connection of residents and businesses to the public water supply.

The removal and disposal of contaminated soil and debris, as well as ecological and archeological assessments and ICs currently protect human health and the environment in the short term. The excavation activities eliminated the risk of exposure to Site COCs in soils, and the ICs prevent exposure to contaminated groundwater. However, in order for the OU-3 remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness: collect soil samples around Front Building and submit for dioxin analysis.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: Press Notice

EPA Reviews Cleanup
A.I.W. Frank Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting a third Five-Year Review of the A.I.W. Frank/Mid-County Mustang Superfund site in Exton. EPA inspects sites regularly to ensure that cleanups conducted remain fully protective of public health and the environment. Prior reviews have determined the cleanup remedy is protective. The results of this review will be available by December 2015.

To access results of the review (starting Dec. 2015):
http://epa.gov/5yr

To learn detailed site and contact information:
http://go.usa.gov/ccgXW

To ask questions or provide site information:
Contact: Carrie Deitzel **Phone**: 215-814-5525
Email: deitzel.carrie@epa.gov

Appendix B: List of Documents Reviewed

EPA, 1995. Remedial Investigation Report, AIW Frank/Mid-County Mustang Site, Chester County, Pennsylvania. April.

EPA, 1995. Record of Decision: A.I.W. Frank/Mid-County Mustang, EPA/ROD/R03-95/20, September.

EPA, 2006. First Five-Year Review Report for AIW Frank/Mid-County Mustang Superfund Site. March.

EPA, 2011. Second Five-Year Review Report for AIW Frank/Mid-County Mustang Superfund Site. March.

HGL, 2015. Focused Feasibility Study for Operable Unit 1, AIW Frank/Mid- County Mustang Site, Chester County, PA, September.

Appendix C. Groundwater Data

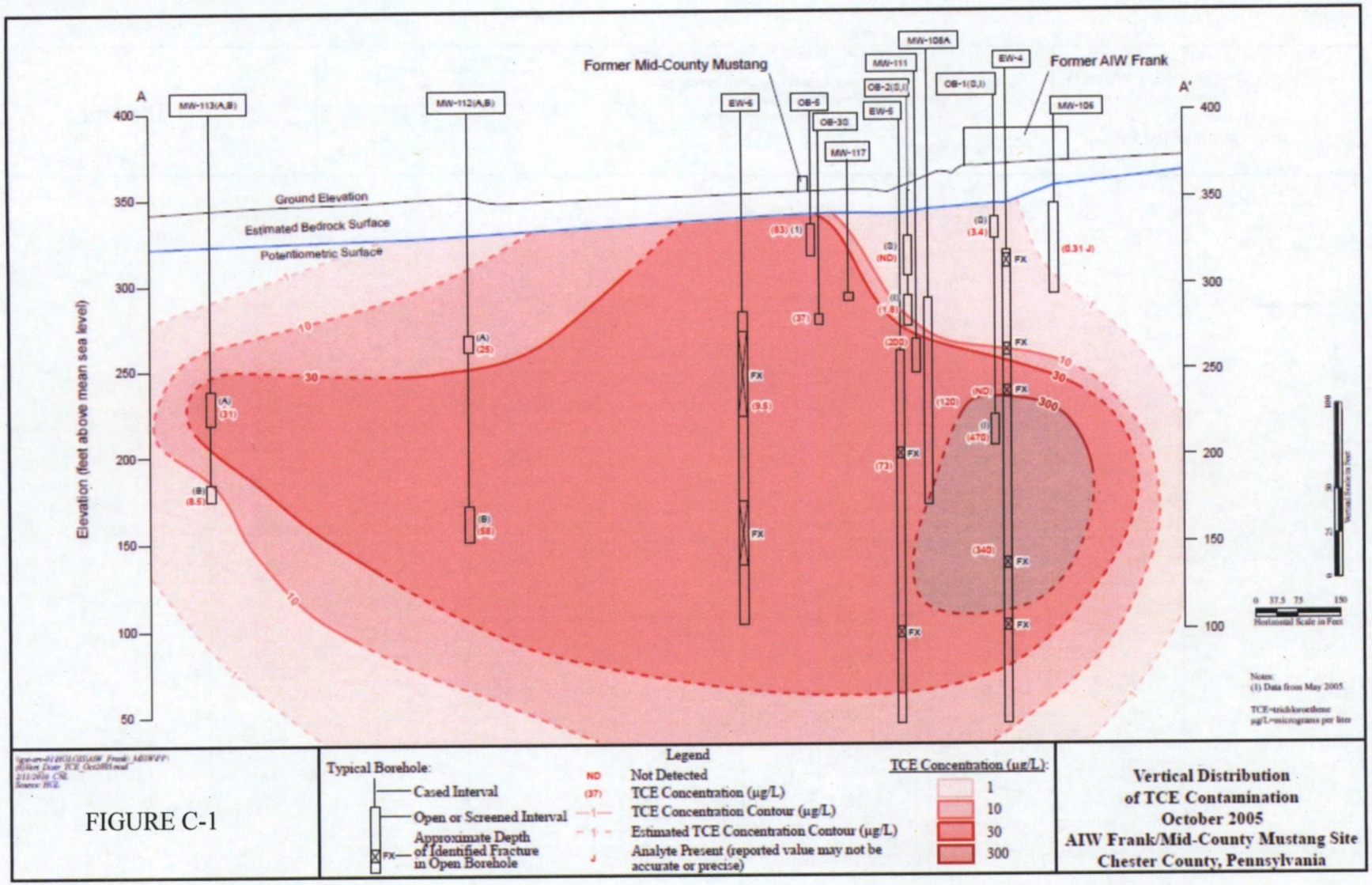


FIGURE C-1

Vertical Distribution of TCE Contamination October 2005 AIW Frank/Mid-County Mustang Site Chester County, Pennsylvania

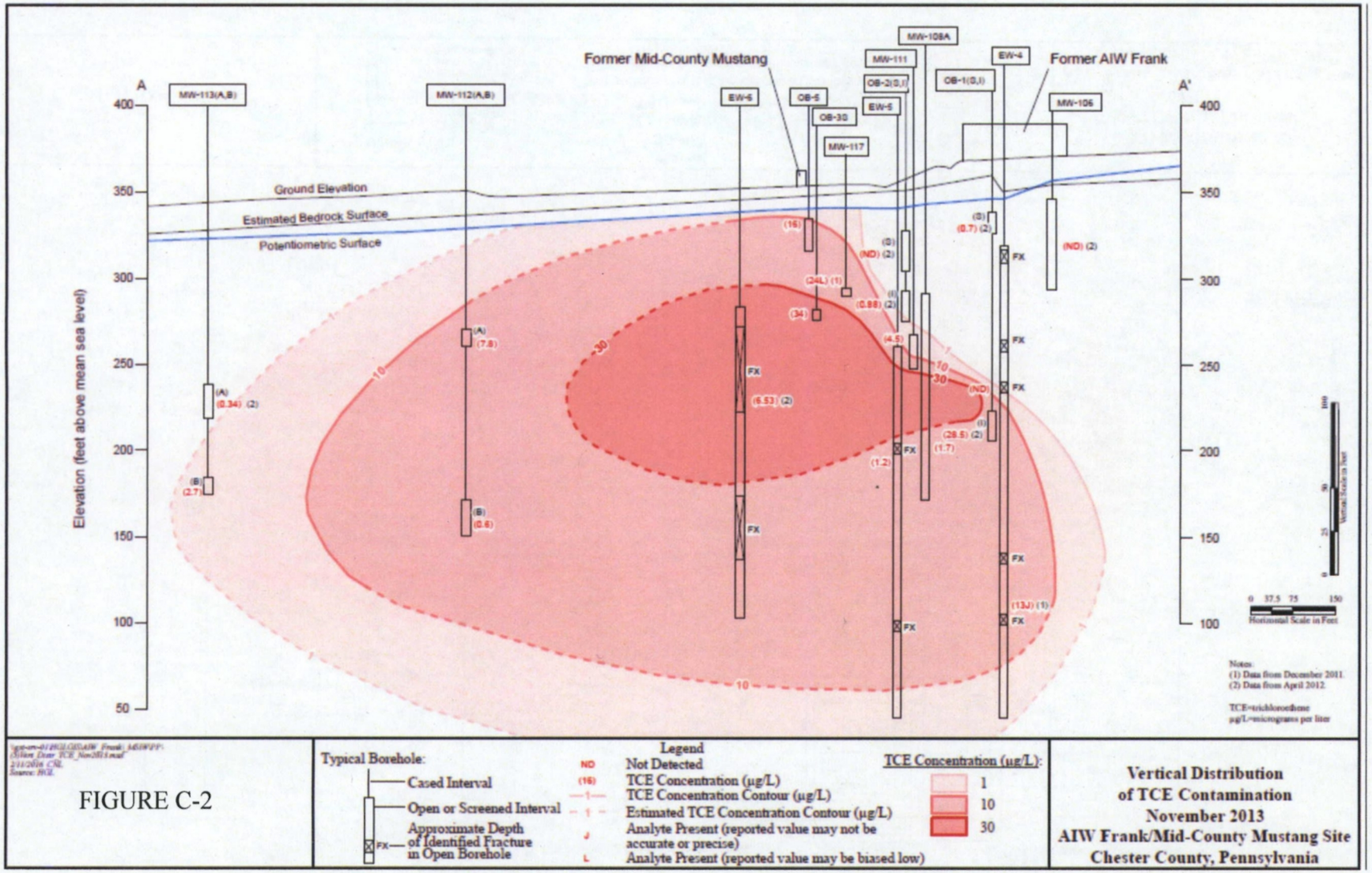


FIGURE C-2

Typical Borehole:

- Cased Interval
- Open or Screened Interval
- FX — Approximate Depth of Identified Fracture in Open Borehole

Legend

ND	Not Detected
(16)	TCE Concentration (µg/L)
—1—	TCE Concentration Contour (µg/L)
- - 1 - -	Estimated TCE Concentration Contour (µg/L)
J	Analyte Present (reported value may not be accurate or precise)
L	Analyte Present (reported value may be biased low)

TCE Concentration (µg/L):

- 1
- 10
- 30

Vertical Distribution of TCE Contamination November 2013 AIW Frank/Mid-County Mustang Site Chester County, Pennsylvania

FIGURE C-3

TCE CONCENTRATION TRENDS
EXTRACTION WELLS
OCTOBER 2000 - NOVEMBER 2013
AIW FRANK/MID-COUNTY MUSTANG SITE

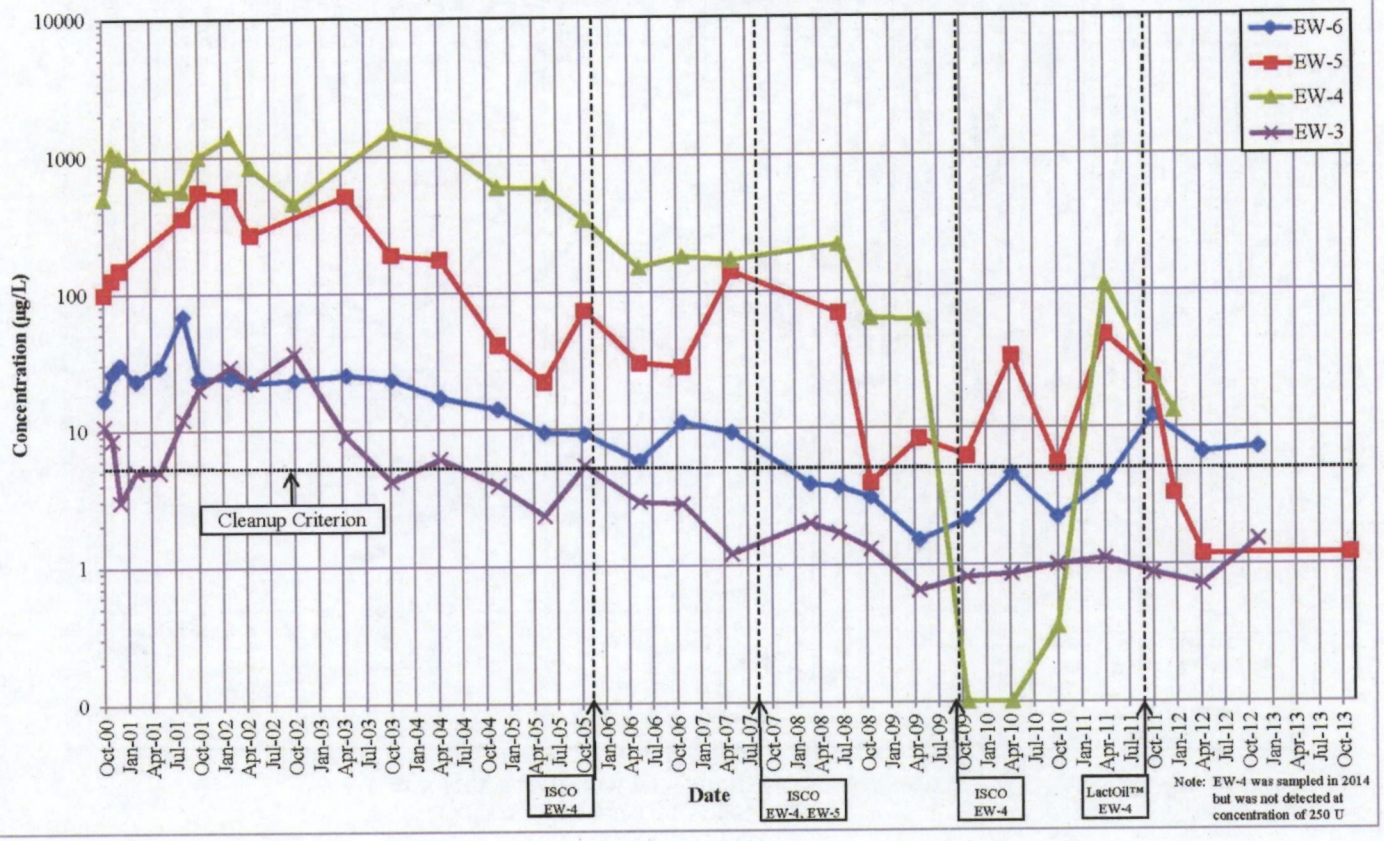


FIGURE C-4

TCE CONCENTRATION TRENDS
SOURCE AREA WELLS
OCTOBER 2000 - NOVEMBER 2013
AIW FRANK/MID-COUNTY MUSTANG SITE

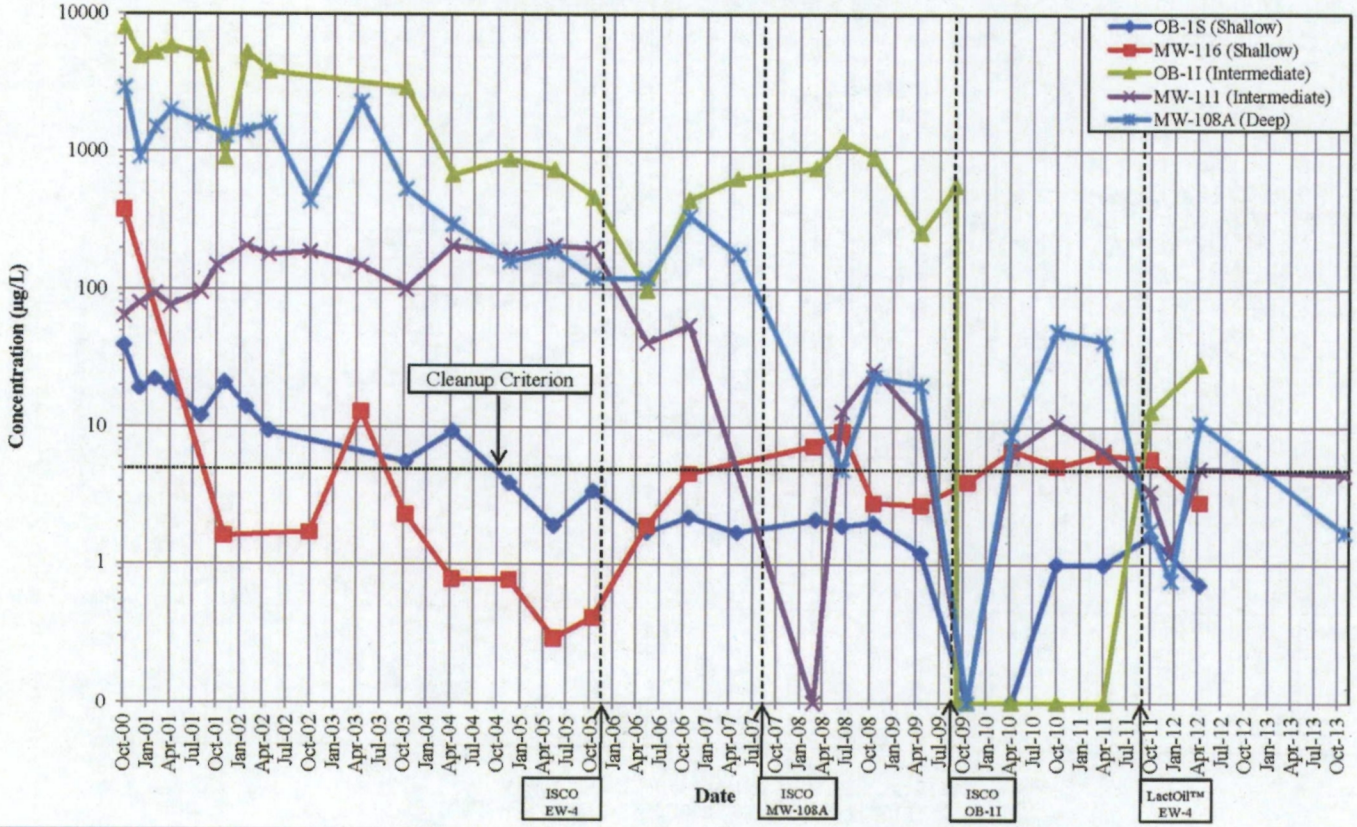


FIGURE C-5

TCE CONCENTRATION TRENDS
MID-GRADIENT WELLS
OCTOBER 2000 - NOVEMBER 2013
AIW FRANK/MID-COUNTY MUSTANG SITE

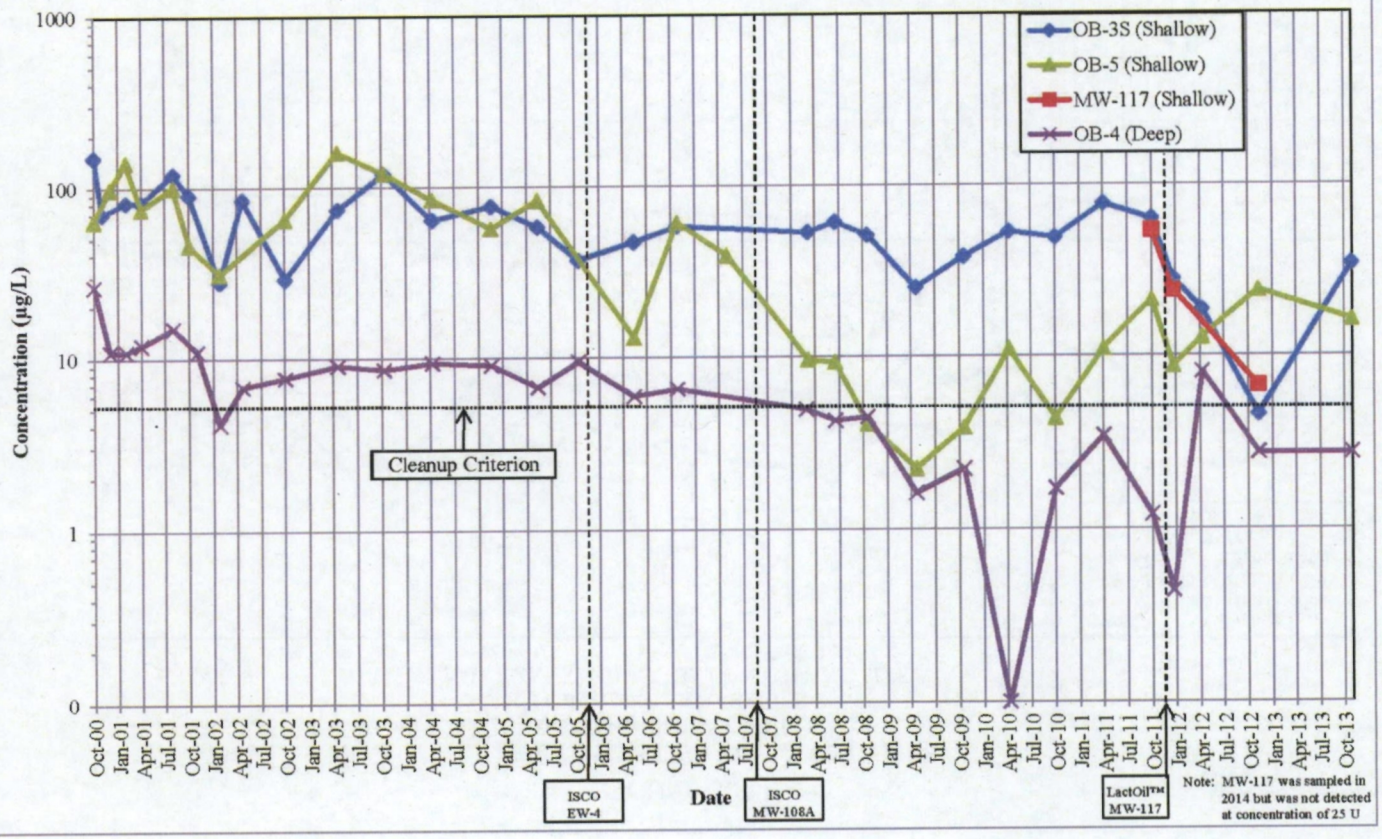


FIGURE C-6

TCE CONCENTRATION TRENDS
DOWN-GRADIENT WELLS
OCTOBER 2000 - NOVEMBER 2013
AIW FRANK/MID-COUNTY MUSTANG SITE

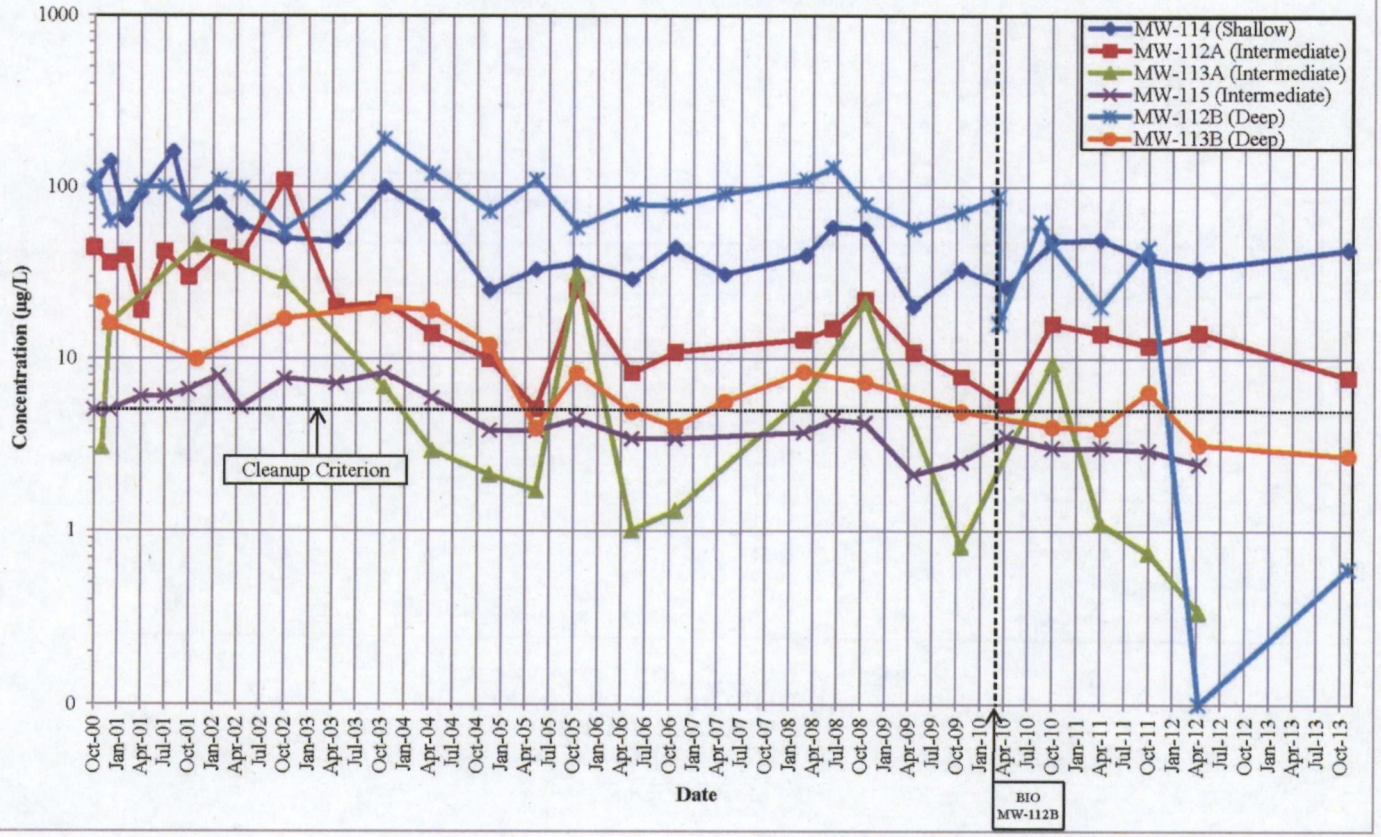
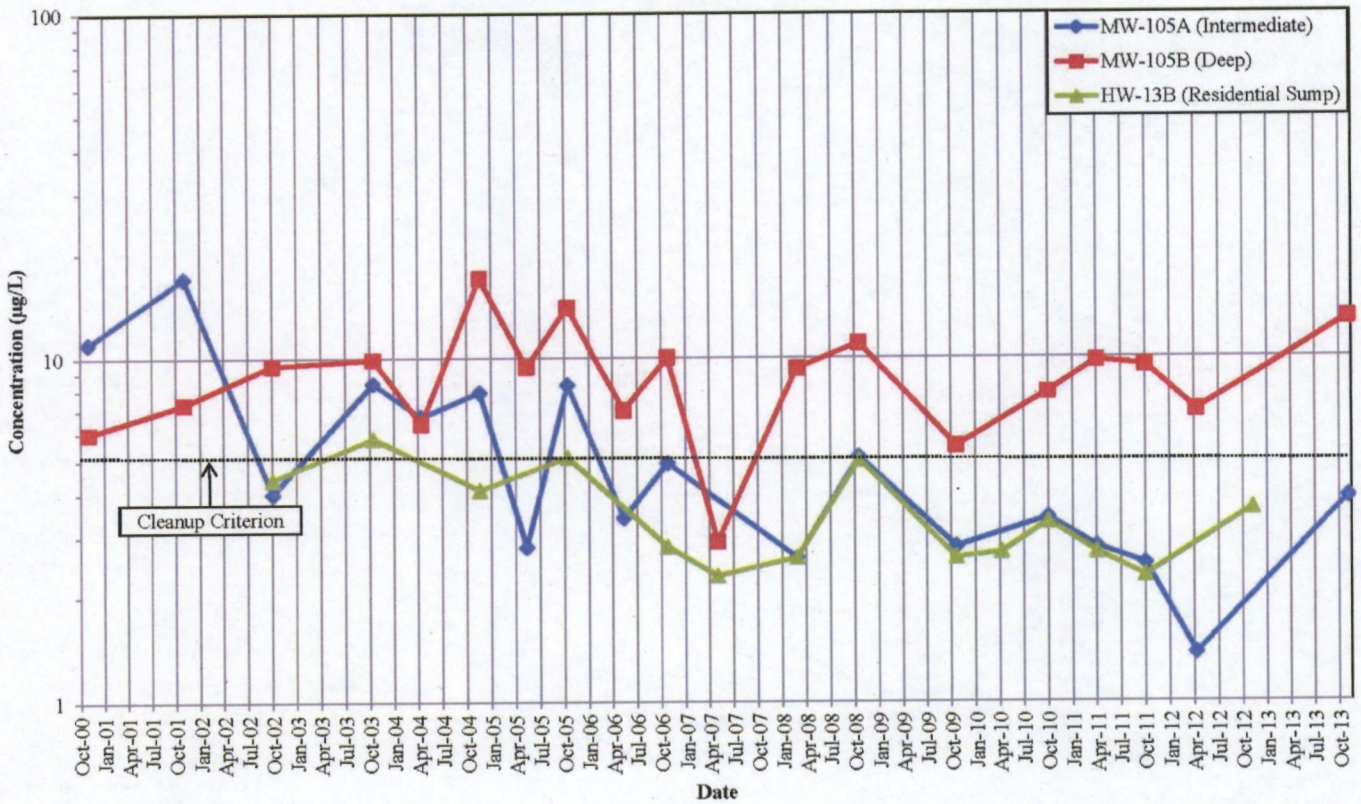


FIGURE C-7

TCE CONCENTRATION TRENDS
FAR DOWN-GRADIENT WELLS
OCTOBER 2000 - NOVEMBER 2013
AIW FRANK/MID-COUNTY MUSTANG SITE



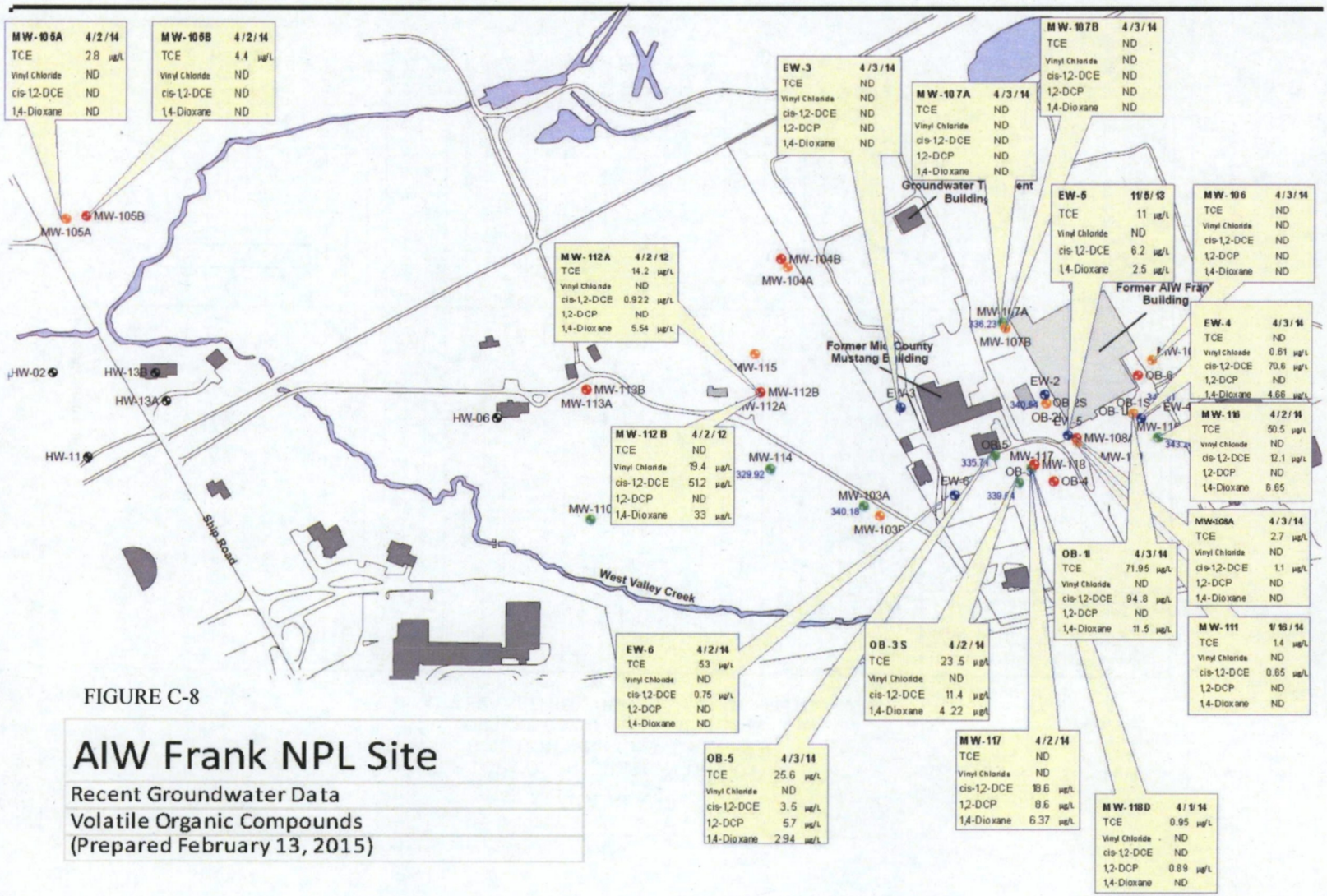


FIGURE C-8

AIW Frank NPL Site

Recent Groundwater Data
Volatile Organic Compounds
(Prepared February 13, 2015)

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: AIW Frank/Mid-County Mustang	**Date of Inspection:** 09/14/2015
Location and Region: Exton, PA	**EPA ID:** PAD004351003
Agency, Office or Company Leading the Five-Year Review: Region 3	**Weather/Temperature:** 60 degrees, sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☒ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☐ Monitored natural attenuation
- ☐ Ground water containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ Name _____ Title _____ Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ Name _____ Title _____ Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.

Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: _____

III. ON-SITE DOCUMENTS AND 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: _____

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: _____

3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

6. **Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

7. **Ground Water Monitoring Records**	☐ Readily available	☐ Up to date	☐ N/A

Remarks: Wells are not consistently sampled and complete data is not readily available.

8. **Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air ☐ Readily available ☐ Up to date ☒ N/A

☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

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

Describe costs and reasons: _____

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

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☒ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ 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 ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ 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	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

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

Remarks: _____

C. Letdown Channels ☐ 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** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement

Arial extent: _____ Depth: _____

Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation

Material type:_____ Arial extent: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion

Arial extent: _____ Depth: _____

Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting

Arial extent: _____ Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions

☐ Location shown on site map Arial extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ 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 ☐ 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 ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

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

Remarks: _____

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

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

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

Remarks: _____

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

Remarks: _____

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

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ 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 ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Ground Water Extraction Wells, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction 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: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ 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 ☐ 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 ground water 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**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Ground water plume is effectively contained ☐ Contaminant concentrations are declining

E. 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: _____

X. OTHER REMEDIES

If there are remedies applied at the site and 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.

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 designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). The remedy is intended to prevent exposure to contaminants in the groundwater, soils and subsurface soil. The soil removal, public water extension and ICs were implemented. The treatment system reduced contaminant levels, while operational.
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. Much of the site is overgrown and not all monitoring wells could be located. The treatment plant is well maintained and protected with a chain-link fence. Several monitoring wells could not be located and wells are not sampled consistently.
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. The treatment system reduced contamination, but was shut down in 2008 during pilot studies. EPA intends to select a modified remedy in 2016.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None noted.

Appendix E: Photographs from Site Inspection Visit

Entry to treatment building.

Treatment system.

Discharge pond.

Monitoring well.

Monitoring wells.

AIW building debris mound.

Signage at treatment building.

Appendix F: Interview Forms

INTERVIEW RECORD		
Site Name: A.I.W. Frank/Mid-County Mustang	**EPA ID No.:** PAD004351003	
Subject: 5-year Review Interview	**Time:** 9:00am	**Date:** 1/7/2016
Type: ☐Telephone ☐Visit ☑Other Email	☑Incoming ☐Outgoing	
Contact Made By:		
Name:	**Title:**	**Organization:**
Carrie Dietzel	Community Involvement Coordinator	USEPA – Region III
Individual Contacted:		
Name:	**Title:**	**Organization:**
Pat Layman	Assistant to Township Manager	West Whiteland Township
Telephone Number: 610-363-9525 x 3219 **Fax Number:** unknown **Email:** playman@westwhiteland.org	**Street Address:** 101 Commerce Drive **City, State, Zip:** Exton, PA 19341	

Summary Of Conversation:

1. **Are you aware of the site and EPA's work to address it?**
   Yes, all are aware of the site and EPA's work to address it.

2. **Do you have any issues, concerns, or suggestions regarding the site you'd like to bring to EPA's attention?**
   Our Public Works Director has a concern with the contractor-type operations going on behind the old Mid-County Mustang building with regard to filling operations, equipment storage, mulch storage - very muddy/denuded area, etc. that could be negatively impacting the stream to the north.

3. **Have you received inquiries or complaints about the site or the remedy from community members?**
   No complaints received about the site or the remedy. Our Planning Director occasionally receives inquiries from people looking to develop the site, but they go no further than initial inquiry.

4. **Aside from direct inquiries, do you know of any community concerns regarding the site?**
   No known community concerns regarding the site.

5. **Are you aware of any incidents or activities at the site, such as vandalism or trespassing?**
   Not aware of any incidents or activities at the site, such as vandalism or trespassing.

6. **Are you adequately informed about site-related activities and progress? (If not, how may we keep you better informed?)**
   The Township is adequately informed about site-related activities and progress.

7. **Do you know of anyone else we should contact during our site review process?**
   Possibly the Chester County Conservation District/PADEP should be contacted regarding the Public Works Director's comments in answer to #2 above.

INTERVIEW RECORD		
Site Name: A.I.W. Frank/Mid-County Mustang	**EPA ID No.:** PAD004351003	
Subject: 5-year Review Interview	**Time:** 8:12am	**Date:** 1/12/2016
Type: ☐Telephone ☐Visit ☑Other_Email_	☑Incoming ☐Outgoing	

Contact Made By:		
Name:	**Title:**	**Organization:**
Carrie Dietzel	Community Involvement Coordinator	USEPA – Region III

Individual Contacted:		
Name:	**Title:**	**Organization:**
(b) (6) [redacted]	Owner of Superfund Site Property	E. Kahn Development Corp.

Telephone Number: (b) (6) [redacted] **Fax Number:** unknown **Email:** ekahn@ekahndevelopment.com	**Street Address:** (b) (6) [redacted] **City, State, Zip:** (b) (6) [redacted]

Summary Of Conversation:

1. **Are you aware of the site and EPA's work to address it?**
   Yes.

2. **Do you have any issues, concerns, or suggestions regarding the site you'd like to bring to EPA's attention?**
   NO, other than a better understanding as to when the metal pump and treat building constructed at the rear of the site will be abandoned. We do not require the building removal but would like to use that area if you are not using the pumping station any longer.

3. **Have you received inquiries or complaints about the site or the remedy from community members?**
   No.

4. **Aside from direct inquiries, do you know of any community concerns regarding the site?**
   No.

5. **Are you aware of any incidents or activities at the site, such as vandalism or trespassing?**
   No.

6. **Are you adequately informed about site-related activities and progress? (If not, how may we keep you better informed?)**
   Yes.

7. **Do you know of anyone else we should contact during our site review process?**
   No.

INTERVIEW RECORD		
Site Name: A.I.W. Frank/Mid-County Mustang	**EPA ID No.:** PAD004351003	
Subject: 5-year Review Interview	**Time:** 9:00am	**Date:** 1/7/2016
Type: ☐Telephone ☐Visit ☑Other Email	☑Incoming ☐Outgoing	

Contact Made By:		
Name:	**Title:**	**Organization:**
Carrie Dietzel	Community Involvement Coordinator	USEPA – Region III

Individual Contacted:		
Name:	**Title:**	**Organization:**
(b) (6) [redacted]	(b) (6) [redacted]	

Telephone Number: (b) (6) [redacted] **Fax Number:** unknown **Email:** unknown	**Street Address:** (b) (6) [redacted] **City, State, Zip:** (b) (6) [redacted]

Summary Of Conversation:

1. **While living at the site were you aware it was a Superfund site?**
   No, not really.

2. **Were you connected to public water?**
   Yes.

3. **Were you living in the property when vapor intrusion sampling occurred?**
   I'm not sure.

4. **Would you like the Vapor Intrusion results sent to you when they become available?**
   No. I'm really not too concerned.

5. **Do you have any issues or concerns you'd like to mention?**
   No, not really.