REMEDIATION WORK PLAN

TORX FACILITY, ROCHESTER, INDIANA

Submitted to:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Prepared for:

TEXTRON, INC.

June 2014

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Prepared for:

TEXTRON, INC.

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June 2014

Project Number: 3359-12-2618

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LIST OF ACRONYMS AND ABBREVIATIONS

1,1-DCE	1,1-dichloroethene
95-UCL	95-percent Upper Confidence Limit
A	Ampere
ABC	Anaerobic Biochem (ABC®)
acfm	actual cubic feet per minute
bgs	below ground surface
bvcA	Vinyl Chloride Reductase Enzyme
cfm	cubic feet per minute
cis-1,2-DCE	cis-1,2-dichloroethene
COCs	Chemicals of Concern
CVOCs	Chlorinated Volatile Organic Compounds
DHC	Dehalococcoides
DKP	Dipotassium phosphate
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
ERC	Environmental Restrictive Covenant
ERD	Enhanced Reductive Dechlorination
FS	Feasibility Study
FSI	Further Site Investigation
Ft	Feet
GC	gas chromatograph
gpm	gallons per minute
HAPs	Hazardous Air Pollutants
HDPE	High Density Polyethylene
HPT	Hydraulic Profiling Tool
HSA	Hollow Stem Auger
ICL	Industrial Closure Levels
IDCLs	Industrial Default Closure Levels
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources

LIST OF ACRONYMS AND ABBREVIATIONS

ID	Inside Diameter
IDW	Investigative Derived Waste
In	Inch
ISCR	In-Situ Chemical Reduction
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MSDS	Material Safety Data Sheet
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MNA	Monitored Natural Attenuation
mV	Millivolts
NAVD	North American Vertical Datum
NPT	National Pipe Thread
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
PCE	Tetrachloroethene
PLC	Programmable Logic Controller
POC	Perimeter of Compliance
PQL	Practical Quantitation Limit
PSI	Pounds per square inch
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAOs	Remedial Action Objectives
RCLs	Residential Closure Levels
RDCLs	Residential Default Closure Levels
REDOX	Reduction-Oxidation
RISC	Risk Integrated System of Closure
RNA	Ribonucleic acid
ROI	Radius of Influence

LIST OF ACRONYMS AND ABBREVIATIONS

RWP	Remediation Work Plan
scfm	standard cubic feet per minute
SHSA	Slotted Hollow Stem Auger
SOP	Standard Operating Procedure
SSTLs	Site-Specific Target Levels
trans-1,2-DCE	trans-1,2-dichloroethene
tceA	TCE Reductase Enzyme
TCE	Trichloroethene
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
WC	Water Column
VC	Vinyl Chloride
vcrA	Vinyl Chloride Reductase Enzyme
VFA	Volatile Fatty Acid
VFD	Variable Frequency Drive
VOC	Volatile Organic Compound
ZVI	Zero-Valent Iron

1.0 INTRODUCTION AND PURPOSE

This Remediation Work Plan (RWP) has been prepared by AMEC Environment & Infrastructure, Inc. (AMEC) to detail full-scale design of the Alternative 4 remedy from the Remediation Feasibility Study (FS), AMEC October 2011. The remedial design addresses dissolved-phase volatile organic compound (VOC) contamination in groundwater associated with the TORX Facility. Alternative 4 was one of seven remedial alternatives presented in the FS that was prepared for the TORX Facility in Rochester, Indiana, referred to hereinafter as Site. In addition, this RWP presents the findings of additional investigations and remediation pilot tests that were performed at the Site as outlined in the July 11, 2012 Additional Investigation and Remediation Pilot Study Work Plan, hereinafter referred to as “July 2012 Work Plan.”

The subsurface investigations that were conducted during October - December of 2012 were performed in accordance with July 2012 Work Plan. They were performed to better define the vertical and horizontal extent of the groundwater VOC plume beneath the facility and down-gradient of the Site.

Remediation pilot testing was conducted at the Site during the 2012 fourth quarter period. As part of the Pilot, tracer and injection step tests were conducted to obtain parameters for final design. A summary of the findings of the tracer test is presented in Section 6.3 of this RWP. A tracer test was also performed in order to understand fluid movement throughout the upper saturated aquifer. Pilot testing was conducted in two areas at the Site using anaerobic reductive dechlorination and in-situ chemical reduction (ISCR) to address dissolved-phase VOCs in groundwater. Each of these remediation technologies was evaluated at the Site in accordance with the procedures outlined in the July 2012 Work Plan and is described in subsequent sections of this RWP. The follow-up performance groundwater monitoring program was completed in April 2013.

1.1 Selected Remedies

Enhanced anaerobic reductive dechlorination (ERD) of chlorinated VOCs (CVOCs) occurs when media (i.e. carbon substrate) is placed or introduced in groundwater. The media recommended by AMEC to biostimulate the anaerobic reductive dechlorination process is a lactate based formula manufactured by Redox Tech, LLC (Redox Tech) and referred to as product Anaerobic Biochem (ABC®). This product, referred to as “ABC” hereinafter, would be mixed with ZVI to augment the ISCR process at select locations of the plume.

In–Situ Chemical Reduction (ISCR) combines ERD with abiotic reduction of chlorinated VOCs using a metal (zero valent iron) substrate. The blend of carbon substrate and ZVI referred to as ABC+(or ZVI in this Plan), is a proprietary formulation registered to Redox Tech under a licensed agreement with Adventus Company (Adventus). Further details of these products and the areas targeted for remediation are presented in Section 8 of this RWP.

In addition to the enhanced reductive dechlorination and ISCR pilot testing, a sub-slab communication and depressurization test was conducted at the Site in December 2012 to gather information for full-scale design to mitigate potential vapor intrusion of VOCs emanating from groundwater beneath the facility during remediation activities. Details of the pilot test are presented in Section 6.6. of this RWP.

Subsequent sections of this report list numerous acronyms and/or abbreviations. In addition, this report includes supporting data in 14 appendices (Appendix A through Appendix N). Please refer to the table of contents section for the list of acronyms, abbreviations, and appendices.

2.0 SITE INFORMATION AND BACKGROUND

2.1 Site Description and Contact Information

The Site, which occupies approximately 96 acres to the west of North Old US Highway 31 and to the south of road E 450 N, is located at 4366 North Old US Highway 31, in Rochester, Fulton County, Indiana. A site location map is attached as Figure 2-1 (Appendix A). The Site is comprised of one large facility operations building (Plant), a parking lot west of the Plant, and a pond located west of the Plant and north of the parking lot. The Site features are shown on Figure 2-2 (Appendix A). Two smaller auxiliary buildings are located south of the parking lot. The size of the Plant is approximately 78,000 square feet. The former main water supply was provided by a supply well located east of the production building along North Old US Highway 31. Process water and fire protection water is currently supplied to the Site from two production wells located west of the production building. Potable water is also supplied to the Site through the extension of the water main from the city of Rochester. Wastewater is processed through a treatment system and discharged to a septic system located north of the production building. The Site is currently operated by Acument Global Technologies/Camcar, LLC (Acument) who produces metal fasteners similar to those that had been historically manufactured at this Site.

Presented below is the Site contact information.

Site Information

Site Name:	TORX Facility
State Cleanup Number:	7100149
Site Mailing Address:	4366 North Old US Highway 31 Rochester, Indiana 46975
Telephone Number:	Contact Mr. Jamieson Schiff, Textron, Inc. 40 Westminster Street, Providence, RI 02903 (401) 457-2422

Investigation Contact Information

Company Name:	Textron, Inc.
Mailing Address:	40 Westminster Street Providence, RI 02903
Telephone Number:	(401) 457-2422
Project Manager:	Mr. Jamieson Schiff

Current Owner Information

Owner/Operator Name:	Acument Global Technologies Camcar LLC-Rochester Operations
Mailing Address:	4366 North Old US Highway 31 Rochester, Indiana 46975
Telephone Number:	(574) 223-3131

2.1.1 Surrounding Property Use

The Site is located in an area mixed with commercial and residential property uses. Figure 2-3 presents (Appendix A) the location of the Site and surrounding properties. Nearby property usage is presented below according to geographic location with respect to the Site.

North: North of the Site across Route E 450 N and west of North Old US Highway 31 is the former Fulton County Landfill, which is now closed.

East: The Site fronts North Old US Highway 31 to the east. Across North Old US Highway 31 is a mix of industrial and residential properties.

South: Approximately 1,000 feet south of the Site along Route E 425 N are single-family residential properties.

West: West of the Site is a wooded area, which extends west to new US Highway 31.

2.2 Site History and Release Background

The Site has been used to manufacture metal fasteners since about 1946. The Site was operated by Textron from the mid 1950's to 2006 when the Site was purchased by Acument. Inside the Plant is a production line where fasteners are made. The Plant has not conducted plating operations; therefore, any parts which required metal finishing are sent off-site for processing. Inside the production area, the Plant also contains a parts washer and heat treatment area.

From approximately 1952 to 1992, process wastewater and non-contact cooling water were discharged into the pond located to the west of the Plant, hereafter identified as the Western Pond [Figure 2-2 (Appendix A)]. The source of the process wastewater included the caustic parts washer and the heat-treat washers. According to the Site Status Report that was dated August 1, 1990 (Heritage, 1990), the wastewater contained various quantities of lubricating oils, cutting oils, quench oils, water soluble oils, metal particles, and dirt.

Sampling of the wastewater discharge in 1986 indicated that heavy metals (cadmium, chromium, copper, and lead) and VOCs were present in the samples. Since process wastewater from the Site operations was discharged into the Western Pond, additional work was proposed to assess the environmental conditions at the Site.

Available information collected to date suggests that operations prior to 1968 utilized trichloroethene (TCE), which is now present within groundwater beneath the facility and down-gradient properties. The primary source area appears to be locations surrounding the former degreaser pit located in the central portion of the TORX Plant [See Figure 2-2 (Appendix A)] and an area adjacent to the south-eastern end of the Western Pond where process wastewater from onsite operations was collected.

2.3 Summary of the Historical Investigations and Previous Corrective Measures (Pre-2008)

Since 1986, numerous investigations have been performed at the Site. Results of previous investigations performed prior to the 2009 Further Site Investigations (FSI) were summarized in the Investigation Work Plan (MACTEC, 2010) that was submitted to IDEM. During the previous investigations and corrective actions, samples were collected from the process wastewater, the Western Pond (surface water and sediment), 15 groundwater monitoring wells, facility production wells, nearby private drinking water wells, soils near the former degreaser pit and Western Pond, seven down-gradient monitoring wells, soil gas down-gradient of monitoring wells MW-6B and MW-6C (soil gas samples), and from the Eastern Pond (discrete groundwater samples).

Historically, the VOCs detected in the samples submitted for laboratory analyses have been mainly cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC). Low-level part per billion concentrations of TCE and trans-1,2-DCE have also been detected in the groundwater samples. During previous remediation work in the early 1990’s, approximately 19,000 tons of sediment and soil were excavated and removed from the Western Pond. Results of the investigations conducted since 2008 are summarized in the following subsection.

2.4 Summary of Further Site Investigations (FSIs)

The FSIs (initial FSI and Phase 2 FSI) were completed in accordance with the Special Notice of Liability that was sent to Textron, Inc. (Textron) on November 19, 2008 by IDEM. The primary purpose of the FSIs was to delineate the vertical and horizontal extent of the VOC plume in groundwater.

During the FSIs, the following tasks were performed:

- Residential Water Sampling
- Residential Treatment System Monitoring
- VOC Investigation in Bedrock Aquifer
- Ecological Evaluation at Down-Gradient Pond (Eastern Pond)
- Source Area Investigation
- Vapor Intrusion Evaluation at the Site and at Down-gradient Properties
- Hydraulic Conductivity Evaluation
- Groundwater Sampling to define the nature and extent of downgradient groundwater impacts

Details of the investigations performed at the Site from 2008 through 2010 are presented in three reports on file with IDEM (MACTEC, 2008, 2009, and 2010). These reports contain complete details of the FSI activities. Figure 2-3 (Appendix A) presents the extent of the study area for the Site and includes the location of the down-gradient monitoring wells. A summary of the activities performed in the FSIs and the overall results relating to VOCs in soil and groundwater are presented in the following subsections. Specifically, results concerning source area sampling, groundwater profiling, downgradient groundwater sampling, and bedrock groundwater sampling are summarized in the following subsections.

2.4.1 Source Area Investigations

During the 2010 Phase 2 FSI, vadose zone soil and groundwater were assessed for contaminants of concern (COCs) beneath the Plant at the former degreaser pit and at other areas of concern. Based on the findings of the Phase 2 FSI, VOCs in soil were not detected at concentrations exceeding industrial closure levels (ICLs) and were not considered COCs in soils. Other potential contaminants, such as metals, were not found in soil or groundwater at levels above ICLs and therefore the only constituents considered to be COCs at the site are CVOCs in groundwater.

Groundwater assessed beneath the former degreaser pit and at other locations contained VOC's exceeding the IDEM ICLs. Table 2-1 (Appendix B) presents the results of the groundwater sampling performed at the source area wells and other wells since 2009. Cis-1,2-DCE was the primary VOC that was detected in the source area and ranged from 50 mg/L in MW-59(29) to 0.002 mg/L in MW-65(32). TCE concentrations identified in the source area wells ranged from 0.190 mg/L in MW-59(29) to 0.005 mg/L in MW-65(32). Vinyl Chloride concentrations ranged from 17 mg/L in MW-59(29) to 0.031 mg/L in MW-65(32). The maximum concentrations of the CVOCs found in the Phase 2 FSI did not suggest the presence of dense non-aqueous phase liquid (DNAPL) in the source area

2.4.2 Vertical and Horizontal Groundwater Profiling and Monitoring

As part of the FSIs, vertical and horizontal groundwater profiling of the aquifer was performed using various drilling methods. Vertical groundwater profiling was conducted by sampling discrete groundwater intervals (approximately 10 feet in length) to aid in selecting screen intervals for permanent groundwater monitoring wells. On-site mobile laboratory testing was used to determine which intervals were to be screened for groundwater monitoring. Based on the results of the vertical groundwater profiling, one or more wells were set at each soil boring location to monitor groundwater, except soil boring locations B54, B58, B64, B64, B66, B69, B70, B73, and B74, where no wells were set. Details of the vertical and horizontal profiling and the results of on-site laboratory analyses are presented in the FSI reports (MACTEC, 2009 and 2010) submitted to IDEM. The well locations are presented on Figure 2-3 (Appendix A). Please note that beginning with well MW-18 the well identification nomenclature identifies the well ID and then the bottom of the well screen in feet in parenthesis [i.e. MW-18(38.6)].

2.4.3 Summary of the Nature and Extent of VOCs in Downgradient Groundwater

COCs in, groundwater, were compared with applicable regulatory or risk-based limits. Site COCs detected in groundwater includes TCE (parent product) and degradation products, which include cis-1,2-DCE, and VC. Based on the findings of the FSIs, these are the primary COCs in groundwater beneath the Site and at down-gradient locations.

Horizontal Extent of Site-Related VOCs in Groundwater

The horizontal extent of VOCs in groundwater was delineated in 2010 by the monitoring well network [Figure 2-3 (Appendix A)]. Based on the results of subsequent groundwater monitoring (See Section 2.5), the horizontal extent of Site related VOCs appear to be defined by the monitoring well network.

The concentration of cis-1,2-DCE is between 50 to 100 mg/L in the source area and decreases to less than 1 mg/L in the proposed down gradient treatment zones. A similar trend is observed for vinyl chloride. Data from the FSI indicated that concentrations of TCE decreased from approximately 0.530 mg/L to approximately 0.200 mg/L in the proposed down-gradient treatment zones.

Vertical Extent of Site-Related VOCs in Groundwater

The vertical extent of site-related dissolved-phase VOCs were delineated in 2010 to the ICLs beneath the Site and to residential closure levels (RCLs) at down-gradient properties. The majority of the VOC impact to groundwater occurs in the uppermost water bearing zone of the overburden aquifer. Aquitards and/or discontinuous lenses consisting of less permeable deposits of silt and/or clay with fine sands exist beneath the uppermost water bearing zone at varying depths of approximately 730 to 770 feet NAVD 88.

Interconnection between saturated horizons is evident due to the presence of VOCs in deeper saturated zones. However in some areas, those deeper saturated zones do not contain VOCs. The interpretative vertical extent of VOCs is shown on numerous cross-sections discussed in Section 3 of this work plan. The vertical extent of VOCs in the overburden groundwater was delineated to ICLs on the Textron property and to RCLs on the down gradient properties. As illustrated by the cross-sections, the concentration of VOCs decrease with depth and distance from the source area. Two arbitrary saturated water bearing zones based on elevations were evaluated in the FS to gain a better understanding of the VOC migration. The two distinct saturated water bearing zones were designated as Zone 1 and Zone 2. Concentration isopleth maps from the December 2010 sampling event were prepared for cis-1,2-DCE, TCE, and VC at the Site in order to evaluate the horizontal extent in these saturated zones. The isopleth contours are presented on Figures 20 through 25 of the FS. Details of the zones are provided below.

Zone 1: Elevation 765 to 786 feet NAVD 88

- This zone is the upper saturated zone beneath the Site that extends east and southeast of the Site.
- Figures 20 through 22 of the FS presents the cis-1,2-DCE, TCE, and VC concentration isopleths, respectively.

Zone 2: Elevation 730 to 765 feet NAVD 88

This zone is the intermediate saturated zone beneath Zone 1. Figures 23 through 25 of the FS presents the cis-1,2-DCE, TCE, and VC concentration isopleths, respectively.

As discussed in the previous sections, the concentrations of VOCs decrease with depth and distance from the source area. The relative concentrations of cis-1,2-DCE and VC compared to TCE concentrations in groundwater, indicate ongoing natural biodegradation in the source area and at down-gradient locations.

It should be pointed out that potential source areas, in addition to the TORX Site, have not been evaluated and therefore no determination has been made regarding whether the Site is the source of VOCs found in all residential wells. Historical activities at properties, including those up-gradient of the TORX Site suggest the possibility of other potential sources of VOCs in the area.

2.4.4 Bedrock Groundwater

Site-related VOCs were not detected in any of the groundwater samples collected as part of the quarterly groundwater monitoring program from the bedrock groundwater monitoring wells. In addition, vertical groundwater profiling completed in 2009 from the upper 20 to 30 feet in the bedrock did not detect any Site-related VOCs in the groundwater samples.

2.4.5 Vapor Intrusion Sampling

The residential vapor intrusion investigation was completed at the Site in 2008. The investigation included the installation of nested soil gas monitoring wells adjacent to several residences. Figure 2-3 identifies the locations of the vapor monitoring wells. The soil gas data were compared to the IDEM Residential Soil Gas Screening Levels as described in the Vapor Monitoring Report (MACTEC, 2009b). Based on this comparison, the 2009 report concluded the vapor intrusion pathway was not significant in the vicinity of the vapor monitoring wells.

2.4.6 Summary of Findings from FSI

- The concentration of VOCs decrease with depth and distance from the source area
- Site-related VOCs were not detected in the bedrock groundwater samples.
- The relative concentrations of cis-1,2-DCE and VC compared to TCE concentrations in groundwater, indicate ongoing natural biodegradation in the source area and at down-gradient locations.
- Residential sampling relative to the potential for vapor intrusion did not find soil gas concentrations at levels that present unacceptable risks

2.5 Remediation Feasibility Study (AMEC 2011)

The FS report was prepared for the Site in accordance with the IDEM, Special Notice of Liability dated November 19, 2008. The FS was prepared by AMEC (formerly MACTEC) to identify and evaluate potential remedial alternatives to address the Site VOCs requiring remediation. Site VOCs detected in groundwater at concentrations greater than RCLs and ICLs include TCE, cis-1,2-DCE, and VC. These VOCs are the COCs associated with historic operations at the Site (Site-related VOCs) and were evaluated in the FS.

Additionally, the FS included a risk assessment evaluation, a summary of the nature and extent of the groundwater VOC plume, and identified potential investigation data gaps pertaining to environmental and human health risks. A summary of the human health risk assessment and data gaps identified during the FS evaluation are presented in the following subsections.

2.5.1 Data Gaps

Subsurface

A comprehensive review of the data obtained from the FSIs revealed some areas at the Site that require additional data collection to allow a better understanding of the distribution of VOCs near the source area and northeast of the Eastern Pond. These data gaps were presented in Section 2.5 of the FS and include:

- Horizontal delineation west and north of MW-59
- Vertical delineation beneath the Plant
- VOC plume delineation northeast of the Eastern Pond
- VOC plume delineation north and east of the 4163 North Old US Highway 31 residence

The specific details regarding the soil and groundwater assessment required to close the data gaps were presented in the July 2012 Work Plan. Details of the subsurface investigations conducted in accordance with the work plan are presented in Section 5 of this report.

Based on elevated VOC concentrations detected in groundwater immediately down-gradient of the Site, a vapor intrusion study was recommended by AMEC at a residence located at 4163 North Old US Highway 31, which is located east of the Site. Numerous requests were made to gain access to implement a vapor intrusion evaluation by both AMEC and IDEM. As of the date of this report, the property owner has not granted onsite access for vapor intrusion studies. Therefore, since an assessment was not performed, this RWP does not include any potential remedies for vapor intrusion 4163 North Old US Highway 31.

2.5.2 Human Health Risk Assessment

A Human Health Risk Assessment (HHRA) was prepared to evaluate and quantify the potential for adverse effects to human health arising from exposure to site-related constituents identified at the TORX Facility Site. The following activities were performed in the order listed below to complete this HHRA.

1. Prepared a Conceptual Site Model (CSM) using the environmental data associated with previous investigations at the Site to evaluate current and potential future human exposures to environmental media associated with the Site
2. Evaluated the chemicals of potential concern (COPC) associated with each environmental media associated with the Site
3. Assessed the toxicity of each COPC
4. Characterized the risk of each COPC at each current and potential future human exposure point

The CSM evaluated some of the potential exposure pathways qualitatively or semi-quantitatively (no risk calculations). Based on in-place institutional controls and the results of sampling analyses, the following pathways were determined to be incomplete during the CSM, and therefore risk calculations were not performed.

- Drinking water ingestion at residential properties that have operating activated carbon treatment systems that effectively remove VOCs.
- Drinking water ingestion at residential and industrial properties where Site-related VOCs have not been detected in the potable water samples.
- Casual contact or recreational contact associated with the surface water associated with Pond A (Property 15), a stream (Property 15), and a tile drain (Property 8) see Figure 2-4 for locations.
- Fish consumption and livestock use associated with Pond A.

The results of this HHRA indicate that the calculated risks for individuals living and/or working near the Site are within or below the cancer Allowable Risk Range and equal to or below the threshold hazard index value of one for the following exposure medium and potential exposure routes.

- Surface Water – Direct Contact

- Sediment – Direct Contact
- Potable Water (Treatment System installed) – Ingestion
- Potable Water (COPCs not detected) – Ingestion
- Indoor Air – Inhalation

Based on the results of this HHRA and the evaluation of the plume stability in the FS completed in 2011, the incomplete exposure pathways identified above will remain incomplete for the foreseeable future for the properties located greater than 500 feet from the source area.

2.5.3 Summary of Remediation Feasibility Study Findings and Conclusions

Based on the data obtained from the FSIs, the human health risk assessment, and the FS, the VOC groundwater plume is the only media at the Site and at down-gradient locations that require remediation. In accordance with the RAOs listed in Section 3.0 of the FS, two exposure pathways present risks to human health; contact with groundwater, and inhalation of vapors from VOCs in groundwater. To be protective of human health at the Site, six alternative approaches were developed to control and/or treat the VOCs in groundwater. The areas targeted for treatment include the primary source area beneath and near the Facility and an down-gradient area east of the Facility. Of the six alternatives, Alterative 4 was selected for the Site to address VOCs in groundwater, as detailed below.

FS Alternative 4 Summary

Alternative 4 of the FS included several remedial technologies to address VOCs in groundwater at the Site and at down gradient locations. Alternative 4 would consist of the following:

- Perform a source area pre-design investigation to refine the limits of the source area.
- Perform pilot tests to evaluate the efficacy and obtain design parameters to use Alternative 4 to treat groundwater containing VOCs at the source area and down-gradient treatment locations.
- Implement source area treatment using a biostimulant known as Product ABC to enhance the ongoing reductive dechlorination of VOCs in groundwater.
- Perform injections of ABC blended with ZVI (referred to as ABC+) immediately down-gradient of the source area to enhance the ongoing

reductive dechlorination of VOCs in groundwater and to degrade VOCs through abiotic degradation processes.

- Implement down-gradient treatment of groundwater using ABC and ABC+.
- Install a sub-slab depressurization system in the Plant overlying the primary source area as a preventive measure to inhibit potential vapor intrusion into the Plant.
- Maintain the whole-house water treatment system engineering control at affected properties until municipal water is supplied to these properties.
- Implement an institutional control consisting of placing Environmental Restrictive Covenants (ERCs) on all affected properties to restrict the use of groundwater for human use or consumption.
- Perform MNA of the groundwater plume down-gradient of the treatment areas and groundwater monitoring using IDEM's closure stability monitoring plan.

2.6 Groundwater Monitoring

Groundwater monitoring has been performed on the monitoring well network since April 2009 in order to determine the groundwater flow direction and extent of site related VOCs in the groundwater. Initially quarterly groundwater monitoring was implemented in order to gain an understanding of the response of the aquifer system to seasonal precipitation fluctuations. Once the site-related VOC plume was defined after one year of quarterly groundwater monitoring and the direction of groundwater flow was established, the monitoring frequency decreased to semi-annually. Upon completion of several years of semi annual groundwater monitoring, the groundwater monitoring frequency at the Site is now implemented on an annual basis.

The annual groundwater monitoring event for 2013 was performed on a select list of wells previously approved by IDEM in 2010. Table 2-1 (Appendix B) presents a comprehensive summary of the results of the groundwater sampling performed at the source area wells and other wells since 2009. Figure 2-5 (Appendix A) presents the concentrations of VOCs detected in the groundwater samples collected from the monitoring wells in April and May 2013.

3.0 GEOLOGIC AND HYDROGEOLOGIC INFORMATION

The Site is located in Fulton County, Indiana. The *Rochester, Indiana Quadrangle* indicates that the highest elevation at the Site is approximately 875 feet (NAVD 88) near the north central portion of the Site, and that the topographic surface east of that point slopes downward to the east toward North Old US Highway 31. West and south of the high point, the surface slopes to the south. Groundwater follows regional topography and flow east/southeast toward the Tippecanoe River, located approximately 5,000 feet southeast of the Site.

3.1 Site Geologic Information

The TORX Facility is located within the Northern Lake and Moraine Physiographic Region, at the border of the Steuben Morainal Lake Area and the Kankakee Outwash and Lacustrine Plain. The bedrock underlying the Site consists of limestone and dolomite of the Lower Devonian Traverse and Detroit River formations. Bedrock dips north-eastward into the Michigan basin. Numerous abandoned and active sand and gravel mining operations are located within a half-mile of the Site.

The lithology beneath the Site and surrounding area consists of interbedded coarse-grained, permeable sediments (sands and gravels) and fine-grained, low permeable sediments (silts and clays) above the limestone bedrock. Generally, the fine-grained deposits appear to be discontinuous and act as aquitards where prominent. A relatively continuous, fine-grained unit is located across a large portion of the study area at the bedrock surface. Numerous geologic cross-sections were prepared for the Site and show the interbedded outwash deposits.

The cross-sections presented in the FS and the July 2012 Work Plan appear to indicate an outwash depositional environment resulting from past glacial activities, the meandering Tippecanoe River, and surface drainage. The coarse-grained sediments are preferential flow paths for groundwater flow and VOC migration. In addition, vertical groundwater gradients and horizontal flow components influence the direction of groundwater flow and contaminant migration.

In addition to the numerous cross-sections presented in the FS and the July 2012 Work Plan, AMEC prepared eight additional geologic cross-sections for the Site to aid in treatment zone refinement. Figure 3-1 (Appendix A) presents the location of the proposed treatment areas and the traverses of the geologic cross-sections. The cross-sections traverse the treatment zones and include additional subsurface data that was collected during the additional investigations and pilot test studies performed in November and December 2012. The geologic cross-sections are shown in Figures 3-2 through 3-9 (Appendix A). These cross-sections also depict the VOC concentrations detected in groundwater obtained during the FSI investigations and updated VOC concentrations detected in groundwater samples collected from the monitoring wells during the annual groundwater monitoring event performed in April and May 2013.

3.2 Hydrogeology

Aquifers identified during the FSI include an overburden aquifer (Maxinkukee Moraine Aquifer System) and a bedrock aquifer (Silurian and Devonian Carbonate Aquifer System). According to the Unconsolidated Aquifer Systems of Fulton County, Indiana map (IDNR, 2008); the Maxinkukee Moraine Aquifer System consists of discontinuous surficial sands and gravels, thick till sequences, and deeper sands and gravels. According to the Bedrock Aquifer Systems of Fulton County, Indiana (IDNR, 2008), Silurian-age carbonate bedrock (Wabash Formation) and Devonian-age carbonate rocks (Muscatatuck Group) compose the bedrock aquifer system in the vicinity of the Site. The bedrock is predominantly overlain by low permeable clay deposits.

3.2.1 Overburden Aquifer

Artesian conditions have been evaluated along the western side of the Eastern Pond in monitoring wells MW-17 and well nest MW-27 [Figure 3-8 (Appendix A)]. Excluding the artesian water conditions, the thickness of the vadose zone in the vicinity of the Site ranges from approximately 8 feet near the Eastern Pond (MW-27 well nest) to an average thickness in the area proposed for remediation of approximately 20 feet. Due to artesian conditions, groundwater levels on the western side of the Eastern Pond can be approximately 0.1 feet above ground surface. Including the lower permeability units, the average overburden aquifer saturated thickness ranges from approximately 140 feet near the Site to less than 100 feet adjacent to the Tippecanoe River.

3.2.2 Bedrock Aquifer

The upper bedrock aquifer is comprised of limestone. The depth to the upper bedrock aquifer varies between 95 feet below ground surface (bgs) at well nest MW-39 to 208 feet bgs at well nest MW-33. Bedrock was encountered at the Site at depths between 150 feet to 178 feet. The bedrock aquifer at the Site is monitored with sixgroundwater monitoring wells (MW-40 through MW-45) installed between 175 feet to 199 feet in depth. Figure 2-3 presents the bedrock monitoring well locations.

3.2.3 Groundwater Elevations, Flow Direction, and Calculated Velocity

Groundwater elevations have been calculated using the depth to water measurements obtained from the monitoring well network and established top-of-well-casing elevations relative to the NAVD 88. The calculated elevations and measured depths to water are included in Table 3-1 (Appendix B). In addition, the depths to surface water have been measured for the Western Pond, the Eastern Pond, and the Tippecanoe River. The elevation of surface water in the ponds were measured from staff gages, and the elevation of surface water for the Tippecanoe River was measured from a surveyed reference point on the Tippecanoe River bridge located just north of the intersection of North Old US Highway 31 and 350N.

Several regional groundwater contour maps have been prepared for the shallow and deep overburden aquifers and the bedrock aquifer. These contour maps are presented in the FSI reports, the FS, and the July 2012 Work Plan. For the shallow overburden aquifer, there appears to be two dominant components of groundwater flow. Groundwater from the Site flows toward the east and southeast. In the vicinity of the Eastern Pond and E 425N, the direction of groundwater flow changes from the east-southeast to the south-southeast. Then, south of E 425N, groundwater flow moves in a more southerly direction.

As for historic events for the deep overburden aquifer, groundwater in the vicinity of the site appears to flow generally towards the south. In the vicinity of the Eastern Pond, the direction of deeper overburden groundwater flow changes to the south-southeast and is similar to the flow direction of the shallow overburden groundwater. For the bedrock aquifer, groundwater flow is generally towards the south-southeast in the northern portion of the Site and towards the south in the southern portion of the Site.

Historic contour maps of the shallow and deep overburden aquifers for the Site and down-gradient properties using five foot contours are presented in Appendix C. Using water level elevations from the April 29, 2013 groundwater monitoring event, AMEC prepared groundwater contour intervals for the shallow (referred to as Zone 1) and intermediate (referred to as Zone 2) overburden aquifers that underlie the remedial treatment zone areas. Figure 3-10 (Appendix A)] presents the groundwater contour of Zone 1 underlying this area. Groundwater elevations used for the uppermost aquifer were obtained from wells screened in the upper 26 feet of the water table (765 to 786 NAVD 88). Figure 3-11 (Appendix A)] presents the groundwater contour for Zone 2 using wells screened from elevations ranging between 730 to 765 feet NAVD 88.

Using the April 29, 2013 groundwater elevations and distances between monitoring wells along the inferred plume centerline, groundwater velocity across the source area and at down-gradient locations was calculated for contaminant transport evaluation. Figure 3-1 (Appendix A) presents the inferred centerline of the dissolved-phase VOC plume across the proposed treatment zones and the approximate distance between monitoring wells. Presented on Table 3-2 (Appendix B) are the calculated groundwater velocities for select areas of the plume between the plume centerline wells. Table 3-2 also presents other parameters (i.e. hydraulic conductivity, and gradient values) used in the calculations along with the groundwater velocity formula. The purpose of estimating groundwater velocity at select areas along the inferred plume centerline is to evaluate groundwater movement at the proposed treatment zones (See Section 6). Please note that Table 3-2 presents the calculated groundwater velocities over relatively large areas across the Site. Due to the heterogeneous nature of the glacial deposits at the Site, localized groundwater velocities can greatly vary.

4.0 IMPLEMENTED CORRECTIVE ACTIONS

During the FSIs, drinking water at residential properties surrounding and down-gradient of the Site was sampled for VOCs. Low-level VOCs were detected in various residential drinking water supplies. In response to the low-level VOCs detected in the drinking water samples, Textron implemented interim corrective actions until a new drinking water source was installed for the Site and surrounding properties.

4.1 Interim Corrective Actions

In 2011, Textron installed whole-house water treatment systems and provided bottled drinking water to residents whose drinking water tested positive for low-level VOCs. In addition, at the request of near-by residents, bottled water was provided and whole-house water treatment systems were installed by Textron at properties where no VOCs were detected in analyzed water samples. The whole-house treatment systems used granular activated carbon filtration and ultra violet lighting to remove organic compounds and disinfection of each drinking water supply. Details of residential drinking water sampling and treatment systems are presented in correspondence on file at IDEM and summarized in the FS.

4.2 Engineering Control – Municipal Drinking Water

4.2.1 Municipal Drinking Water Extension Project

As part of the remedial alternative selected for the Site, Textron completed the municipal drinking water extension project during the first calendar quarter of 2013. Municipal drinking water is now supplied to all surrounding properties. Water from the City of Rochester is piped approximately 5 miles to the Site and distributed through a booster station to the surrounding properties. Presented in Appendix D is a list of properties tied into the municipal water supply system.

The South Richland Conservancy District was established to operate, and maintain, the water system. The district is responsible for day to day operations in maintaining the drinking water system which is comprised of a main extension line, hydrants, and a control building for pressure and chlorine treatment.

4.2.2 Whole House Treatment System Removal

Following the completion of the municipal drinking water extension project and tie-in to all the affected properties (i.e. currently occupied) in 2013, the whole-house water treatment systems were phased out and removed from the water supply to each property.

4.3 Institutional Control – Environmental Restrictive Covenants

Excluding the down-gradient property owned by Textron, ERCs were placed on surrounding properties, recorded on the deeds, and filed with the Fulton County Auditors Department. Copies of the ERCs were submitted to IDEM and mapped by the IDEM Office of Land Quality, Science Services Branch. The ERCs were established to restrict the use of groundwater beneath the Site and surrounding properties. According to the ERCs, groundwater beneath the Site and surrounding properties cannot be used as a source of drinking water. Establishment of this institutional control along with the supply of municipal drinking water eliminates the drinking water pathway at the site and surrounding properties. Presented in Appendix D are a list of properties and the IDEM GIS ERC map for each property containing an ERC.

4.4 Remedial Objectives for the Site and Down-Gradient Affected Properties

Remedial objectives for the groundwater ingestion pathway include:

1. Provide municipal drinking water for the Site and surrounding properties to eliminate the groundwater ingestion pathway.

2. Placement of ERCs for the Site and affected surrounding properties to eliminate future groundwater ingestion.

3. Provide and /or maintain plume control (through active remediation) to minimize migration of VOCs above MCLs at properties where ERCs have not been obtained. Properties down-gradient and/or cross-gradient of the Site that do not have an ERC include:

    - Fulton County Property ID 008-113002-00

    - Fulton County Property ID 008-118038-00

    - Fulton County Property ID 008-11601056

4. Maintain stable and/or decreasing plume concentrations at the Site and down-gradient affected properties subsequent to remediation processes outline in this RWP.

As described above, remedial objectives number one and two have already been implemented. Excluding the Site property (Acument Facility) and the Textron owned property adjacent to the Site, ERCs have been placed on properties where VOCs were detected (Table 2-1) at concentrations exceeding MCLs.

Textron intends to place an ERC on the properties owned by Textron east of the Site.

Plume stability monitoring will commence following termination of remediation activities, which are described in Section 8 and 9 of this RWP. Details of plume stability monitoring recommended for the Site and surrounding properties are included in Section 11 of this RWP.

As previously described in Section 2.4.5, the off-site soil gas sampling survey did not identify any unacceptable risks to residential receptors via the vapor intrusion pathway. The RAO with respect to the vapor intrusion pathway at the Site (TORX Plant) is to mitigate sub surface gas migration into the facility during active remediation to maintain indoor air quality below levels that may present unacceptable risks.

5.0 DISSOLVED-PHASE PLUME INVESTIGATION

The dissolved-phase plume investigations were implemented in October and November 2012 in accordance with the July 11, 2012 Pilot Study Work Plan. The investigations were recommended to better define the vertical and horizontal extent of the groundwater VOC plume beneath the facility and down-gradient of the Site. The areas assessed included:

- Areas west and north of MW-59
- Areas beneath the Plant
- Northeast of the Eastern Pond
- Areas north and east of the 4163 North Old US Highway 31 residence (Figure 3-1 presents these areas)

The subsurface investigations were performed using three individual drilling rigs and two drilling techniques consisting of hollow-stem auger (HSA) and rotosonic drilling. The July 2012 work plan outlines the rationale for using the above referenced drilling rigs and provides detail on drilling procedures, well installation procedures, and sampling procedures.

Two HSA drilling rigs were used for these investigations. One of the HSA rigs was equipped with a slotted HSA (SHSA) for vertical aquifer groundwater profiling. The other HSA rig was a low-profile track rig which was utilized inside the Plant and at various outside locations for the installation of pilot test wells (See Section 6). The third rig utilized rotosonic drilling techniques and was used to install nested wells within a common borehole.

Soil and groundwater sampling were performed at the select areas to determine geological and constituent concentrations at each location, refine treatment zones and complete site delineation. Continuous soil sampling (excluding off-set locations) occurred at each location regardless of rig type.

Ten soil borings were installed at the Site to provide additional data for the dissolved plume investigation. The soil borings were designated as B-76 through B-85. These borings were subsequently converted to monitioring wells and designated as MW-76 through MW-85. The location of the soil borings (MW-76-MW-85) are presented on Figure 2-3 and Figure 3-1 (Appendix A). At soil boring B-81 and B-84, offset borings were drilled to install more than one well for screening different vertical intervals of the shallow overburden aquifer. In addition, based on data obtained from soil boringMW-81, an additional soil boring (MW-89) was installed to delineate the plume north of soil boring MW-81.

The investigations were guided by field screening soil and groundwater samples for target CVOCs. This was accomplished by analyzing groundwater samples from the soil borings (i.e. vertical aquifer groundwater profiling) using a mobile gas chromatograph (GC) operated by AMEC GC technicians. GC analyses of groundwater samples for field screening used a vapor headspace analyses technique for analyses of target CVOCs, which included TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and VC.

Utilizing the mobile GC and vapor headspace techniques, AMEC was able to identify the vertical groundwater zones that contained the greatest concentrations of CVOCs for well placement. Details of the procedures for preparing samples and standards for vapor headspace analyses, description of the GC equipment, set-up, operation, calibration, and quality control procedures are presented in the July 2012 Work Plan.

The following subsections identify the areas and a description of the drilling process and well completions. Soil lithology and well completion data for each location is presented on soil boring logs in Appendix E.

5.1 CVOC Plume Assessment beneath the Plant Building

Using a low profile track-mounted HSA drilling rig equipped with 4¼ inch diameter augers and HSA drilling techniques, AMEC installed four soil borings (MW-76 through MW-79) inside the plant in October 2012 to obtain relevant data to aid in full-scale design of the source area biostimulation treatment area (see Figures 3-3 and 3-6). As part of full-scale design, the soil borings were installed to evaluate the presence of silt aquitards and the presence of potential DNAPL on top of silt or clay aquitards. Drilling advancement followed a flow chart presented in Section 5 of the July 2012 pilot study work plan to minimize vertical migration of potential DNAPL.

During the soil boring activities, DNAPL was not observed at any of the soil borings advanced beneath the Plant. Screening for potential DNAPL at each soil boring was performed by:

- Visual inspection of soil cores
- Visual inspection of water samples
- Organic vapor measurements recorded during the field screening of soil cores
- Vapor headspace analyses performed on soil and/or water samples utilizing the on-site mobile GC laboratory

At boring B-77(MW-77), mobile laboratory analyses of a sample at ~30 ft bgs which is slightly above a previously observed silt aquitard indicated cis 1,2 DCE at a concentration of 255 mg/L. This concentration of cis 1,2 DCE is potentially indicative of the presence of residual DNAPL.

The soil borings were advanced to a maximum depth of 42 feet BGS, below the 770 feet NAVD 88 elevation where silt aquitards had been previously observed west of the facility at MW-52, MW-56, and MW-59. At this depth, source area assessment of groundwater was limited to the upper 17 feet of the water bearing zone. With the exception of soil boring B-78, the soil borings were advanced to below the 770 foot NAVD 88 elevation to evaluate uniformity of the silt aquitard

Silt layers were observed in soil borings B-76, B-77, and B-79. These silt layers are depicted on geologic cross-sections B-B’ (Figure 3-3) and E-E’ (Figure 3-6) presented in Appendix A. Figure 3-1 (Appendix A) presents the locations of the traverses for the referenced geologic cross-sections. Based on the geology interpretation, silt layers near the 770 foot NAVD 88 elevation as shown on the referenced cross-sections do not appear to continuous beneath the Plant.

As depicted on the referenced cross-sections, the silt layers below the water bearing zone vary in thickness and in depth. Soil and/or water samples were collected from the soil borings prior to advancing through the silt layers in order to assess for potential DNAPL and the magnitude of CVOC impact to groundwater. The procedures for soil sample and groundwater sample collection along with sample preparation are detailed in the GC standard operating procedure (SOP) that was presented in the July 2012 Work Plan.

Based on the results of vapor headspace analyses (utilizing the Mobile GC laboratory) performed on soil and groundwater samples obtained from the soil borings, the majority of the CVOC impact to groundwater occurs in the uppermost water bearing zone of the overburden aquifer. Where less permeable deposits of silt and silt with fine sands exist beneath the groundwater surface, the CVOC impact beneath these zones are significantly less than the CVOC impact above these zones and in some cases by one to two orders of magnitude. Interconnection between these saturated horizons is evident due to the presence of CVOCs in the deeper saturated zones.

The results of the headspace analyses performed on the soil samples collected from the soil borings is presented on Table 5-1. The results of the headspace analyses performed on the groundwater samples collected from the soil borings are presented on Table 5-2 and on the soil boring logs (Appendix E).

In addition to vapor headspace analyses, select water samples were collected from the soil borings and submitted to ALS Laboratories for analyses. The samples analyzed by ALS are identified by the suffix “fl” identifying the sample for fixed laboratory analyses. The results of the fixed laboratory analyses performed on groundwater samples obtained from the soil borings are presented on Table 5-2 (Appendix B). Copies of the laboratory reports produced by ALS are presented in Appendix F.

Following soil boring installation, soil borings B-76 though B-79 were completed as 2-inch diameter wells with a screen length of approximately 2.5 feet. Wells MW-76, MW-78, and MW-79 were screened within the upper 10 feet of the water bearing formation where the greatest CVOCs were detected in groundwater. The well screen intervals for these wells are similar to the existing wells (i.e. MW-72) beneath the Plant.

Monitoring well MW-77, which is near MW-72, (Figure 3-3 and Figure 3-5) was screened at approximately 15 to 17 feet below the groundwater surface to monitor CVOCs in groundwater beneath less permeable sand and silt layers. The locations of the monitoring wells are presented on Figure 3-1 (Appendix A).

5.2 CVOC Plume Assessment West and North of Monitoring Well MW-59

In accordance with the July 2012 Work Plan, using a track-mounted HSA drilling rig equipped with 4¼ inch inner diameter augers and HSA drilling techniques, AMEC installed soil borings B-80 (MW-80) and B-81(MW-81) to the west and north of MW-59 to better define the source area treatment zone. Soil boring B-80 was installed along the southeast edge of the Western Pond and soil boring B-81 was installed along the paved road north of MW-59 and east of the Western Pond. The location of these soil borings are shown on Figure 3-1 with cross section interpretations shown on Figures 3-2 and 3-4.

Soil borings B-80 and B-81 were also installed and completed as monitoring wells to monitor the performance of the source area biostimulation pilot test. Soil borings B-80 and B-81 were advanced to 22 and 28 feet bgs, respectively. Due to the presence of a silt layer at approximately 20 feet in B80 and low organic vapor headspace screening results, drilling operations ceased and the soil boring was completed as 2-inch diameter monitoring well equipped with 5 foot of 0.010-inch slotted screen.

Soil boring B-81 encountered a silt and fine sand layer and a fine sand layer at depths between 18 to 22 feet bgs. These layers exhibited high organic vapor responses. The organic vapor screening concentrations dropped off in the silt layer encounter below 22 feet bgs. Soil boring B-81 was completed as a monitoring well to evaluate the VOCs concentrations in the silt and sand layer directly beneath the 18 to 22 foot bgs layer.

During the installation of soil boring B-81 the soil between the depths of 10 feet to 14 feet exhibited an oily feel. Therefore, two soil samples collected from B-81 from approximately 10 to 14 feet bgs were analyzed by the on-site mobile laboratory for target VOCs to assess for potential DNAPL due to this oily residue. VOCs were not detected above the detection limits in the soil samples. The results of the analyses are presented on Table 5-1.

Subsequent to installing the well in soil boring B-81, a water sample was collected on October 17, 2012 from monitoring well MW-81 and analyzed for target VOCs using the mobile laboratory. Target VOCs were detected in groundwater at elevated concentrations as follows:

- TCE - 9,200 µg/L
- cis-1,2-DCE - 18,500 µg/L
- VC - 3,300 µg/L

Based on the results of the headspace analyses performed on the water sample obtained from MW-81(27) on October 17, 2012, an offset soil boring (B-81B) was installed to assess the vertical extent of dissolved-phase TCE for full-scale remedial design.

On October 20, 2012, utilizing the track-mounted HSA drilling rig, AMEC advanced soil boring B-81B to 42 feet bgs. While drilling B-81B, a groundwater sample was collected from the augers at a depth of 30 to 35 feet bgs using the vertical groundwater sampling protocol and analyzed for VOCs in the mobile laboratory. VOCs were detected in the groundwater samples, however, the organic vapour headspace screening results obtained from the soil sample collected in B-81B were not significant. Therefore, soil boring B-81 was terminated into a silt and clay and was sealed with bentonite.

In addition to drilling soil boring B-81B, a second offset boring was installed to the north to delineate the northern extent of VOCs in this area. The soil boring was designated as B-89 and was completed as a 2 inch diameter monitoring well [MW-89(28)] to a depth of approximately 28 feet bgs.

On December 3, 2012, an additional offset soil boring (B-81C) was advanced in this area in order to monitor groundwater above a clay layer at approximately 42 feet bgs. Drilling was performed using a rotosonic drilling rig utilizing two casings to prevent any potential carry-down of contaminants. During the drilling activities, groundwater samples were collected from select intervals. The results of the analyses performed on the groundwater samples are summarized on

Table 5-2. Soil boring B-81C was completed as a 2-inch ID monitoring well [MW-81(45)] to a depth of approximately 45 feet bgs.

5.3 VOC Plume Assessment near 4163 N. Old Highway 31

Although VOCs were not detected in groundwater extracted from the residential water well at 4163 North Old US Highway 31, based on the concentration isopleths presented in the FS that were prepared for Zone 2, it appears that VOCs exceeding RCLs may extend beneath the north-eastern portion of the 4163 North Old US Highway 31 property along the northern boundary.

In order to evaluate Zone 2 for potential COCs, AMEC installed three soil borings in the general area north and east of this property using HSA drilling methods. Figure 3-1 (Appendix A) presents the location of the three soil borings referred to as soil boring B-82, B-83, and B-84.

During the soil boring installation, vertical groundwater sampling in accordance with the July 2012 Work Plan was conducted. The results of the analyses performed on the groundwater samples are summarized on Table 5-2 and on the soil boring logs (Appendix E).

Soil borings B-82, B-83, and B-84 were advanced to approximately 59, 64, and 76 feet bgs, respectively. At each soil boring location, the borings were completed as a 2-inch diameter monitoring well. Screened intervals were selected based on the results of the groundwater profiling and soil lithology, both of which are presented on the soil boring logs in Appendix E. The vertical groundwater analytical data obtained from soil borings B-82 were consistent with data from wells MW-12 and MW-13 whereas CVOC concentrations at B-83, were negligible. These data confirm that the existing groundwater monitoring well network is located near the centerline of the VOC plume.

Due to the presence of silt layers identified in soil boring B84 at approximately 45 feet bgs and detectable concentrations of TCE in groundwater at the 39-44 foot interval, an offset soil boring was advanced to 44 feet bgs and completed as a monitoring well [MW-84(45)]. Figure 3-1 presents the location of the soil borings completed as groundwater monitoring wells. Table 5-2 presents the results of the groundwater profiling performed soil borings B-82 through B-84.

5.4 VOC Plume Assessment Northeast of Eastern Pond

To further define the VOC plume in groundwater northeast of the Eastern Pond, one soil boring (B-85) was installed at the property located at 4377 North Old US Hwy 31. The soil boring was drilled to 150 feet using rotosonic drilling methods and was completed as a monitoring well nest. Soil boring B-85 is located approximately 500 feet north to northeast of the Eastern Pond. Figure 3-1 (Appendix A) presents the location of soil boring B-85. The well nest included three individual wells screened at select intervals.

During the advancement of drilling equipment, groundwater samples were collected at selected intervals and analyzed onsite using the mobile laboratory. Based on the results of the headspace analyses, VOCs were not detected in any of the analyzed groundwater samples. Table 5-2 and the soil boring log for B-85 presents the results of the headspace analyses performed on the selected groundwater samples.

The three screened intervals of the nested well were selected based on soil lithology and depth. The bottom of the three 5-foot well screens were installed at 39, 69, and 129 feet bgs and designated monitoring wells MW-85(39), MW-85(69) and MW-85(129), respectively.

5.5 Groundwater Monitoring Well Survey, Development, and Sampling

5.5.1 Soil Boring and Monitoring Well Survey

AMEC retained the services of an Indiana licensed professional surveyor to establish the top of casing elevation and ground surface elevation for each newly installed monitoring well and the ground surface elevation for each soil boring. In addition, the surveyor determined the horizontal coordinates of the monitoring wells and soil borings using US State Plane Coordinates, North American Datum of 1983 (NAD83), Indiana East Zone, US feet. The vertical coordinates of the monitoring wells will be tied to the North American Vertical Datum of 1988 (NAVD 88).

5.5.2 Monitoring Well Development, Purging, and Sampling

Prior to development and sampling activities, the groundwater levels in the newly installed and existing monitoring wells were measured. The depth to water was measured from a surveyed reference point. The volume of water within each well was calculated using the depth to groundwater measurement and the total depth of the monitoring well. Development and purging methods were accomplished by pumping or manual bailing methods. The technique used was based on the diameter of the monitoring well and the volume of water required to be removed. Monitoring wells less than 2-inches in diameter were developed and purged by (1) bailing with a disposable polyethylene bailer or (2) peristaltic pump, while monitoring wells greater than or equal to 2-inches in diameter were developed and purged with a submersible pump fitted with dedicated polyethylene tubing.

The newly installed monitoring wells were developed prior to sampling. During development, water quality (temperature, pH, and specific conductance) was measured and a minimum of five well volumes of water was removed. Development continued until at least five well volumes were removed and the water quality measurements stabilized within approximately 10 percent variance over three successive measurement intervals. The results of the well development are presented on the development logs presented in Appendix G.

Groundwater samples were collected from the newly installed monitoring wells in accordance with the July 2012 Work Plan. Subsequent well sampling was performed in accordance the Site's IDEM approved groundwater sampling frequency. All groundwater samples were submitted to ALS Laboratories (an off-site, fixed-base laboratory) for VOC analyses using USEPA Method SW8260B.

Prior to the collection of groundwater samples, water quality (temperature, pH, and specific conductance) was measured and a minimum of three well volumes of water will be evacuated. Samples were collected once a minimum of three well volumes have been removed or the water quality measurements have stabilized within approximately 10 percent variance over three successive measurement intervals. The results of the purging and sample collection are presented on the monitoring well sample logs presented in Appendix G.

Table 2-1 presents a summary of the results of the laboratory analyses performed on the water samples collected from the monitoring wells. Laboratory reports are presented in Appendix F.

6.0 REMEDIATION PILOT TEST

The FS selected Alternative 4 as the recommended approach to treat groundwater containing chlorinated VOCs at the source area and down-gradient treatment zones. As described in Section 1, Alternative 4 involved treatment of the source zone by ERD. Groundwater migrating from the TORX Facility adjacent to Old Highway 31 would be treated by ISCR using a combination of ZVI and a lactate-based carbon source. Alternative 4 also included treatment of the groundwater plume in the downgradient treatment zones using ERD in combination with an injected ZVI permeable reactive barrier at the downgradient edge of Treatment Zone 4 in the vicinity of MW-16 and MW-26.

The July 2012 Pilot Study Work Plan described these technologies, the products selected as the amendments and presented the approximate location for the pilot testing. The location selected for the source area biostimulant test was near monitoring wells MW-59 and MW-81 east of the western pond. The location of the ISCR pilot test area was located down-gradient of the proposed treatment areas near monitoring wells MW-16 and MW-26. Figure 3-1 depicts the locations for the pilot tests. Figures 6-1 and 6-2 (Appendix A) present the layout for each pilot test area, respectively.

The biostimulation amendment used for the pilot test, referred to as Product ABC, is manufactured by Redox Tech, Inc. The MSDS for Product ABC is presented in Appendix H. Product ABC consists of a special blend of lactates, glycols, esters, fatty acids, and a phosphate buffering agent. The amendment selected for the ISCR pilot tests consists of micro-sized ZVI powder mixed with Product ABC. The MSDS for the ZVI are also presented in Appendix H.

6.1 Objectives

The objectives of the Pilot Study were identified in the Additional Investigation and Pilot Study Work Plan and included:

- Determination of geochemical conditions and population of dehaloccoides (DHC) in areas targeted for treatment
- Evaluation of injection distribution patterns
- Evaluation of the injection area of influence
- Evaluation of injection parameters (pressures and flow rates) within the formation limits and
- Completion of amendment injections in localized areas to evaluate the concept design loading.

Competing electron acceptors (DO, nitrate, ferric iron, and sulfate) must be reduced to achieve optimal conditions for anaerobic dechlorination. Data from the FSI indicate that the geochemical conditions in the source area and down-gradient treatment zones are generally anaerobic with redox potentials in the iron reducing range. The concentrations of nitrate, alkalinity, ferrous and total iron, manganese and sulfate were not determined in the groundwater in the FSI. Characterization of these parameters in the areas targeted for treatment was needed to support remedial design. As such, AMEC collected samples from select monitoring wells and analyzed samples for the above referenced inorganic parameters (See Section 6.2).

Most studies indicate that complete reductive dechlorination from PCE or TCE to ethene requires a sufficient population of DHC. Groundwater samples were collected in both the ERD and ISCR pilot study areas prior to and after the pilot injections to determine baseline DHC populations and the effect of amendment addition on those populations. Additional discussion on DHC populations is in Section 6.4 and 6.5.

Injection of the reagents at rates or pressures that exceed the limits of the aquifer matrix can result in daylighting or surfacing of reagent and flows along preferential pathways that would not provide uniform distribution of the amendments. Therefore, pilot testing is generally conducted to determine proper injection conditions, injectate distribution patterns, and the area of influence from the injection point. The following sections present the results of the baseline groundwater sampling, pilot injection distribution and areas of influence, and the results of performance monitoring in both the ERD and ISCR pilot study areas.

6.2 Baseline Sampling

Baseline groundwater sampling for geochemical parameters [oxidation-reduction potential (ORP), dissolved oxygen, and pH], competing electron acceptors, fatty acids, and the presence of chlorinated hydrocarbon degrading bacteria was performed at select wells in the source area and downgradient treatment areas. Table 6-1 presents a list of geochemical parameters (alkalinity, total organic carbon) and competing electron acceptors (nitrate, sulfate, iron, and manganese) that were tested for and the corresponding analytical methods. In addition to this list, field parameters including temperature, pH, dissolved oxygen (DO), ORP specific conductance, turbidity, and ferrous iron were tested. With the exception of ferrous iron, the field parameters were collected using an YSI meter equipped with a flow-thru cell. Ferrous iron was collected using a colorimetric test kit by HACH Company.

The results of the baseline sampling and post injection sampling for both pilot test areas are presented on Tables 6-2 though 6-5 in Appendix B. These tables list the wells that were sampled as part of baseline sampling and also include wells that were sampled subsequent to pilot test injections.

Table 6-2 presents the results of the field measured parameters and total organic carbon (TOC). The baseline data for the ERD Pilot Area was derived from monitoring wells MW-59(29), MW-81(27), PM-1, PM-2 and PM-3. The baseline data for the ERD Pilot area indicated a mean redox potential of -61.6 mV and concentrations of dissolved oxygen from 0.06 to 0.61 mg/L. This geochemical data indicated anaerobic conditions in the iron reducing range. The mean pH in the area of 6.84 units was within optimal range. Competing electron acceptors iron, manganese, and nitrate were at very low concentrations. Sulfate concentrations ranged from 1.7-7.9 mg/L. The baseline geochemistry indicated very suitable conditions for ERD.

The wells that were present in the ISCR Pilot Area prior to injection included MW-16 and MW-26(17.5) and MW-26(28). The geochemistry of the ISCR Pilot Area was not as reducing as the ERD pilot area. Redox potential in this area ranged from -32 mV to 204 mV with a mean of 50.1 mV. The dissolved oxygen concentrations ranged from 0.20-0.28 mg/L indicating anaerobic conditions. The very positive redox potential observed in the deeper interval of MW-26 may have been anomalous since DO in this interval was similar to results from other wells in this area. Concentrations of iron and manganese were low at these wells with a maximum iron concentration of 2.9 mg/L at MW-26(17.5). Sulfate concentrations were very slightly elevated ranging from 12-21 mg/L. Although slightly elevated concentrations of the competing electron acceptors were observed at these wells, these levels would not be expected to interfere with either biological or abiotic dechlorination.

Table 6-3 presents the results of target VOCs along with molar mass concentrations. Injection well INJ-1 was the only well in the ERD Pilot area with a detectable concentration of PCE in the baseline sampling. TCE was also detected at INJ-1 at 35,000 μg/L in the baseline sampling. Well MW-81(27) on the northern side of the ERD Pilot area was the only other well with a significant baseline detection of TCE (13,000 μg/L). Although PCE and TCE were not detected or were present only at very low levels at wells MW-59(29), PM-1 and PM-3, cis-1,2-DCE concentrations were significant and relatively consistent with results at all of these wells of approximately 40,000 μg/L. The highest baseline concentration of vinyl chloride (10,000 μg/L) was found at MW-59(29). At many of these wells, the molar concentrations of vinyl chloride were much lower than cis-1,2-DCE suggesting that dechlorination had historically occurred but stalled.

TCE was found at concentrations of 4.1 μg/L at well MW-26(17.5) to 42 μg/L at well MW-16 in the baseline sampling in the ISCR Pilot Area. As indicated for the ERD Pilot Area, cis-1,2-DCE was also the predominant chlorinated VOC in the ISCR pilot area. Baseline concentrations of cis-1,2-DCE ranged from 45-770 μg/L. Molar concentrations of 1,2 DCE were generally one to two orders of magnitude greater than for TCE. Baseline molar concentrations of vinyl chloride were generally similar to those found for 1,2 DCE at each well.

Table 6-4 presents the results for chlorinated hydrocarbon degrading bacteria, dissolved gases, and fatty acids. Baseline Dehalococcoides (DHC) levels were very low in the ERD Pilot area with the exception of MW-59 where the dechlorinating species was present at 3.18×10^4 cells/ml which is within the range of population that will support complete dechlorination. In the ISCR pilot area, baseline DHC levels were very low and also well below populations needed to sustain complete dechlorination.

Table 6-5 presents the results of the inorganic compounds and metals. Baseline results for these species were previously summarized with geochemical data. Laboratory reports for the baseline sampling are presented in Appendix F and details regarding the groundwater sample collection from each well are summarized on the monitoring well sample collection logs presented in Appendix G.

6.3 Pilot Tests for Design Parameters

Pilot tracer testing to support design of ERD based treatment of the source area and down gradient treatment zones was conducted in the vicinity of existing monitoring well MW-61. The array of tracer test observations wells, the tracer injection well, and existing well MW-61 are shown on Figure 6-1 (Appendix A). The observation wells are notated by the distance and cardinal direction they are from the injection well, i.e. OW-33E is 33 ft. east of the injection well.

6.3.1 Installation of Injection and Observation Wells

Figure 6-1 (Appendix A) provides a plan layout of the injection well and the observation wells. Two linear arrays of observation wells were installed east to west and north to south from the injection well location. The east to west array includes an additional monitoring point, which is existing well MW-61. The linear array of observation wells west to east, the injection well, and existing well MW-61 are shown on cross-section Figure 6-3. As shown on the cross section, the shallow injection and observation wells were installed such that their screened intervals were within the same sand formation as existing well MW-61. In addition to the cross section shown on Figure 6-3, Figure 3-4 (Cross Section C-C') presents a cross section of the observation well array, north to south.

The tracer test wells were installed using HSA drilling methods and soil sample collection procedures described in Section 6.3.2 of the July 2012 work plan. The injection well was constructed of 1-inch ID Schedule 40 PVC riser and equipped with a five foot long, 0.010-inch factory slotted screen. The observation wells were constructed of 2-inch ID Schedule 40 PVC riser and equipped with a five foot long, 0.010-inch factory slotted screen. Well completion logs for each of the observation wells and the injection well are presented in Appendix E.

Observation Well Development

The tracer test observation wells were developed approximately two days after installation. During development, water quality (temperature, pH, and specific conductance) was measured and a minimum of five well volumes of water was removed. Development continued until at least five well volumes had been removed and the water quality measurements stabilized within approximately 10 percent variance over three successive measurement intervals. Development logs for the observation wells are presented in Appendix G.

6.3.2 Step Injection Test

In order to determine sustainable aquifer injection rates and pressures for remedial injection design, a step injection test was conducted in October 2012. The step injection tests were conducted in order to determine in-situ subsurface hydraulic properties to develop injection parameters (pressures and flow rates within the aquifers limits) to be used in the source area biostimulation pilot study, as well as in the design for full-scale treatment.

The injection step tests influenced the aquifer through constant injection of potable water at several sets of rate and pressure conditions. During injection, pressure in the formation will increase and will be manifested as mounding (change in hydraulic head) in the observation wells. Mounding decreases with radial distance from the injection well and mounding increases with increasing volume or duration of time that the injection continues. Accordingly, the aquifer's response to injection was measured by pressure transducers in observation wells.

The layout for injection and observation wells for the initial pilot testing is presented in Figure 6-1. In general, injection patterns in overburden materials are elliptical in nature and the layout pattern for the observation wells was based on this anticipated distribution pattern. The primary hydraulic gradient direction was previously determined to be to the east in this area. Figure 6-3 (Appendix

A) presents a cross section of the injection well and the observation wells from west to east along with monitoring well MW-61.

During the step injection test, potable water was introduced into the subsurface via a 1-inch injection well connected to a centrifugal pump via PVC hose. Potable water was obtained from a process source at the facility at approximately 40 gpm and 40-50 psi and stored for each step test in a set of two 1,100-gal polyethylene tanks. Each step test was performed at a given pressure and flow rate. At each set pressure and flow condition or “step”, the injection continued until a set injection volume had been reached. Flow rate and total volume measurements were recorded by a digital flowmeter/totalizer in the pump discharge line. Pressure gauges were installed in line at the pump and injection well head.

The injectate volume for each step was selected to simulate the volume of injectate anticipated during a subsequent injection of Product ABC during the proposed biostimulant pilot test. In order to prevent surfacing, development of preferential pathways, or fracturing of soils, moderate injection pressures and flow rates were used. Moderate injection conditions that do not significantly stress the formation also ensure good distribution. In addition to more moderate injection conditions, a step test was performed at an estimated maximum set of conditions. The estimated maximum sustainable formation “take” rate for this pilot study was 20 gallons per minute (gpm). The injection step test used three different injection rates as shown below in tabular format.

Injection Step Tests

Test Number	Flow Rate (gpm)	Pressure (psi)	Injection Volume (gallons)
1	15	5-10	2,600
2	7.5	5-10	2,000
3	20	5-10	2,000

Water table elevations were continuously monitored throughout each of the tests using electronic pressure transducers/conductivity probes (In-Situ Aqua Troll 200s) located in the screened interval of the observation wells. These probes provided real-time, integrated measurement of water levels among the observation wells. In addition to continuous monitoring by the pressure transducers, periodic water level measurements with a water level meter were taken to ensure excessive mounding was not taking place. After completion of each injection rate test, sufficient time for the static water table to equilibrate to within 10% to 20% of baseline was allowed before beginning the next step of the test.

Step Injection Test Results

In all three step injection tests minimal mounding was observed in the observation wells and pressures at the injection well head were from zero to slightly negative values (vacuum), indicative of a highly conductive formation. Transducer data from the three step tests also indicate a conductive matrix. In all step tests, aquifer pressure increased almost instantaneously (mounding occurred) at all observation wells upon beginning injection. However, this instantaneous pressure change was very limited (less than 0.4 psi). This pressure spike was followed by a low gradient sustained pressure increase over the course of the step test and a sharp return to baseline levels once the step test was complete. In the three step tests there was no “day lighting” or surfacing. Pressures observed at the injection well head were zero to negative, while delivery pressure from the pump varied between 5-10 psi. Due to the conductive nature of the matrix, the subsurface did not cause back pressure while injecting. Therefore the pressures estimated for this step test were not achieved.

Step Test 1 Results

Step Test 1 was conducted on October 30, 2012, and had a sustained flow a rate of 15 gpm and total volume of 2,600 gallons. A sharp increase in aquifer pressure in the observation wells was recorded by the pressure transducers immediately after the injection began. This initial pressure declined slightly within about 15 minutes of starting injection and pressure subsequently increased slowly throughout the approximate three hours of this step test. However, the instantaneous pressure change was limited to less than 0.4 psi. In the observation wells along the north axis (transverse to the anticipated flow direction) the instantaneous pressure increases ranged from 0.18-0.335 psi and decreased with distance from the injection well. The temporal relaxation following this “spike” ranged from 0.037 to 0.05 psi and also declined with increasing distance from the well. Along the eastern axis, the initial pressure spike ranged from 0.146 to 0.35 psi and declined with distance from the injection well. The temporal decline in pressure along the eastern axis ranged from 0.03 to 0.1 psi and generally declined with distance from the well.

Mounding declined sharply once the injection ceased. As shown in Graphs I-1, I-2, and I-3 (Appendix I), 75% of the mounding recovery occurred instantly when the step test was completed, with water levels recovering to baseline conditions in approximately two hours.

Mounding was observed in all observation wells within a 33 ft. radius of the injection well. The magnitude of mounding decreased with distance from the injection well in all directions with a maximum mounding of 0.83 ft at OW-3N.

Observation wells nearest the injection well, OW-6W, OW-3E, OW-3N, and OW-6N had similar levels of mounding between 0.67 – 0.83 ft. with slightly less mounding in the east direction. This data suggests an elliptical pattern only slightly elongated to the primary flow direction (indicating a more radial area of influence). Further from the injection well, wells OW-15E, OW-25E, OW-15N, and OW-25N displayed this same pattern, have mounding levels between 0.35 and 0.51 ft.

Pressure readings from monitoring well MW-61, which is located 50 ft. east of the injection well, displayed a negligible influence from the step test (likely due to a difference in the screened interval elevations). The furthest observation well in which mounding was observed was OW-33E with 0.35 ft of hydraulic head observed. At an injection rate of 15 gpm, the area influenced extended at least 33 ft. to the east and at least 25 ft. to the north.

The data from Step Test 1 inferred that the aquifer is capable of accepting an injection flow rate of 15 gpm and an estimated volume of injectate anticipated for a remedial injection. Mounding in the north wing of observation wells was slightly higher than that of the corresponding well of the same distance in the down gradient east wing with ratios of approximately 0.8 suggesting an ellipse with a slightly greater primary axis. The temporal pressure relaxation observed within approximately 15-30 minutes of starting injection may indicate development of a preferential flow path because the injection was short circuiting due to a too high of a flow rate.

Step Test 2 Results

Step Test 2 was conducted on October 31, 2012, and had a sustained flow a rate of 7.5 gpm and total volume of 2,000 gallons. Similarly to Step Test 1, a sharp but very limited increase in aquifer pressure in the observation wells was recorded by the pressure transducers immediately after the injection began. Unlike Step Test 1, relaxation of the initial pressure within 15-30 minutes of starting injection was not observed in this step test. The initial pressure was sustained throughout the duration of this step test in the wells closest to the injection point. In the observation wells along the north axis, the instantaneous pressure increases ranged from 0.08-0.18 psi and decreased with distance from the injection well. At wells 15 and 25 ft from the injection point, pressure increased by another 0.02 psi (0.045 ft) throughout the duration of the step test. Along the eastern axis, the initial pressure spike ranged from 0.06 to 0.16 psi and declined with distance from the injection well. Wells furthest from the injection point along the east axis also demonstrated a slight pressure increase beyond the initial spike over the duration of the test. Mounding declined sharply once injection ceased. As shown in Graphs I-4, I-5 and I-6, Appendix I, 80% of the mounding recovery occurred instantly when the step test was completed, with water levels recovering to baseline conditions in approximately one hour.

Similar to Step Test 1, the wells nearest the injection well, OW-6W, OW-3E, OW-3N, and OW-6N had similar levels of mounding between 0.30 – 0.41 ft. with slightly less mounding in the east direction. Further from the injection point, wells OW-15E, OW-25E, OW-15N, and OW-25N displayed a similar pattern, with limited variation from OW-15E to OW-33E, from 0.18 to 0.16 ft. respectively. Slightly less mounding was observed in the wells along the east axis.

The ground water elevation level at an injection rate of 7.5 gpm mounded approximately fifty percent less in all observation wells than it did with injection rate of 15 gpm. Observation wells were influenced to a distance of 33 ft. in the down gradient direction and 25 ft. in the cross gradient direction. Mounding was slightly higher in the north wing wells in comparison to the wells located equidistance from the injection well in the east wing with ratios of approximately 0.7 suggesting that a more elliptical pattern is developed at lower injection rates. The lack of a temporal pressure relaxation within approximately 15-30 minutes of starting injection may indicate that short circuiting was not occurring or that preferential pathways had been developed in the initial step test.

Step Test 3 Results

Step Test 3 was conducted on October 31, 2012, and had a sustained flow rate of 20 gpm and total volume of 2,000 gallons. The aquifer displayed a similar response as Step Test 1 and 2 in which there was a rapid but limited rise in pressure upon beginning the injection, constant pressure over the course of the test, and rapid recovery to baseline conditions once the test was complete. Hydraulic pressure vs. time for each observation well is presented in Graphs I-7 through I-9 (Appendix I).

Mounding was observed in this step test at all observation wells with the exception of MW-61. The area of influence at a flow rate of 20 gpm was at least 33 ft in the down gradient direction, with mounding steadily decreasing with distance from 0.74 ft at OW-3E to 0.37 ft. at OW-25E. In the north wing of observation wells, mounding decreased with distance from the injection well, having an elevation to 0.94 ft. at OW-3N to 0.51 ft. at OW-25N.

Mounding was approximately 0.15 ft. higher in the cross-gradient observation wells compared to the observation wells in the down-gradient eastern wing the same distance from the injection well, i.e. OW-25N mounded 0.51 ft while OW-25E mounded 0.37 ft. The ratios of the primary to secondary axes remained in the range of 0.72 to 0.78.

Step Test Conclusions

The three step tests demonstrated that the aquifer matrix could accept injection rates up to 20 gpm with minimal mounding, but the higher flow rates (15 and 20 gpm) short-circuited or developed preferential pathways likely in the cross gradient direction. At 7.5 gpm, the pressure gradient was relatively constant throughout the test and the temporal relaxation observed in the initial step test was not observed. However, at an injection rate of 7.5 gpm more mounding occurred in the cross-gradient direction than down gradient, indicating that injection rates less than 7.5 gpm are required for proper distribution. Back pressure from the formation was not observed in the highest step injection rate of 20 gpm, therefore no additional pressure is required for delivery of injection fluid to the aquifer and surfacing of liquid due to over pressurization of the aquifer is not expected.

6.3.3 Area of Influence Test

Area of Influence Test Procedure

In order to evaluate the pattern and area of influence of the overburden injection wells, a tracer solution of dipotassium phosphate (DKP) was injected into the subsurface. After injection, conductivity was measured at the observation wells over time. A DKP concentration verses conductivity curve Graph I-10 (Appendix I) was generated to estimate loading and conductivities that would be observed in the aquifer at various distances from the injection point. The curve was generated from the following concentrations and conductivities:

Concentration DKP	Concentration mg/L	Conductivity µS/cm[a]
0.0005 M[b]	87	127
0.001M	174	240
0.002M	348	481
0.005M	870	1,109
0.01M	1,740	2,080
0.3 WT[c]	3,000	3,000
0.5WT	5,000	5,000
1.0 WT	10,000	11,000

[a] µS/cm=microSiemens /cm
[b] M=Molar
[c] WT=Weight percent

Following completion of the step injection test, a tracer injection was conducted on November 1, 2012 in order to evaluate injection distribution patterns and the area of influence. During this tracer injection pilot 600 lbs of DKP was mixed in

4,000 gallons of water. The injectate solution of DKP had an approximate conductivity of 18,000 µS/cm as indicated in Graph I-10 (Appendix I). A flow rate of 7.5 gpm and pressure of 0-5 psi was selected since the step tests had indicated that injection rates of 7.5 to 15 gpm could be readily handled without significant mounding. At the time of the tracer test, the step tests results, which indicated that preferential pathways might be observed at that flow range, had not been compiled. Tracer injection was conducted for approximately 9 hours.
Groundwater elevation and conductivities were monitored continuously at the observation wells shown on Figure 6-1 during injection using electronic conductivity probes (i.e. In-Situ Aqua Troll 200s). The probes were located in the screened interval of the observation wells and measurements began 15 minutes before the start of the DKP injection. Continuous conductivity and water level measurements were taken every two minutes in the observation wells for a period of two weeks in the northern and western (up gradient) wells and for three weeks in the eastern (down gradient) wells. After the initial three week period, conductivity measurements using a flow through cell were taken at the observation wells every two weeks for a period of six weeks.

Area of Influence Test Results

Graph I-11 (Appendix I) provides results of the tracer test for the upgradient observation well OW-6W. OW-6W, located up-gradient from the injection well, experienced an increase in conductivity of 634 µs/cm on November 7, 2012, six days after injection. The increase in conductivity had a brief retention time, returning to normal conductivity level in seven hours. No other monitoring locations exist west of OW-6W. Therefore the extent of influence in the up gradient direction may not be entirely defined. However, the increase in conductivity observed at OW-6W was less than 50% of that observed at OW-6N. Additionally, the time required for appearance of the tracer was similar to the time of appearance at 25 feet on the north and east axis indicating that only limited flow occurred in the upgradient direction.

Graphs I-12 through I-15 present results for observation wells OW-3E through OW-25E along the east axis. Conductivity measurements at the observation wells nearest to the injection point in the down gradient direction OW-3E and OW-10E did not indicate a significant change as a result of the tracer injection. This could be due to the injected material missing the screened interval of the wells entirely, due to the rate of injection or possibly from a scaling error with the transducers. The first appreciable conductivity change in the down gradient direction was observed in OW-15E approximately 89 hours after the injection. Conductivity rapidly rose over 1,000 µs/cm and lasted less than one hour before returning to baseline conditions. The solution traveled a distance of 15 ft. indicating an approximately velocity of 4.5 ft/day in the subsurface that resulted from both “hydraulic push” during injection and subsequent advective transport. Based on the mass of tracer injected, the conductivity change anticipated to occur at this observation point would have been approximately three times greater than the spike that was observed.

At observation well OW-25E a spike in conductivity occurred on November 10, 2012, approximately 210 hours after injection. The conductivity rose from 230 µs/cm to 860 µs/cm and had a retention time of four hours before returning to baseline conditions. The tracer displayed a velocity of approximately 2.8 ft/day in the subsurface that results from both injection “push” and subsequent advective transport. The observed spike in conductivity was approximately half of the increase anticipated to occur at this observation point. OW-33E and MW-61, located further down gradient, did not show a substantial increase in conductivity. Therefore, the tracer injection observations suggest a down gradient influence of 25 ft.

Graphs I-16 through I-19 present results for observation wells OW-3N through OW-25N along the north axis. In the cross gradient northern wing observation wells, a substantial increase in conductivity was observed almost immediately after injection. OW-3N displayed the highest conductivity readings from any observation well, increasing from 630 µs to a maximum of over 7,800 µs/cm in approximately 12 hours. Elevated conductivity readings at OW-3N rapidly decreased to 3,700 µs in the first 24 hours from the beginning of the injection, and then slowly declined over the next seven days before returning to baseline conditions. The observed spike in conductivity was approximately one half of the increase anticipated to occur at this observation. Based on the appearance of the observed spike, the tracer displayed a velocity of approximately 6 ft/day. This change in conductivity resulted primarily from hydraulic push during injection.

OW-6N also displayed a spike in conductivity within 12 hours of the injection, with the conductivity rapidly rising from 360 µs/cm to 2,300 µs/cm. This change in conductivity resulted primarily from hydraulic push during injection. The conductivity values rapidly decreased over the next 18 hours to 1,000 µs/cm, and then slowly dissipated over the following seven days back to baseline conditions in a constant manner. The conductivity data at OW-6N would suggest a subsurface velocity of 11.6 ft/day. The observed conductivity at OW-6N was one fourth of the anticipated level based on the injectate concentration.

OW-3N and OW-6N displayed a detention time of the injected solution of approximately seven days before returning to baseline conductivity values. Observation wells OW-15N and OW-25N did not indicate an appreciable change in conductivity values.

Area of Influence Test Conclusions

In the downgradient direction, conductivity rose to over 1,000 µs/cm at OW-15E approximately 89 hours after the injection. A significant conductivity increase to 860 µs/cm was also observed 25 ft. from the injection well in the eastern direction approximately 210 hours after injection. These changes in conductivity resulted from both the initial “hydraulic push” during injection and subsequent advective transport. Observation points located further downgradient in the easterly direction did not indicate any conductivity change. A very significant conductivity spike to 2,300 µs/cm was observed very rapidly at OW-6N but a significant conductivity change was not observed at OW-15N. The change in conductivity at the wells in close proximity to the injection point resulted primarily from hydraulic push during injection. These data suggest an elliptical distribution pattern with a major axis of 25-30 ft and a minor axis between 6 and 15 ft.

A significant change in conductivity was observed in the observation points that are closest to the injection point in the direction transverse to the anticipated flow but a change in conductivity was not observed in wells 3-10 ft from the injection point in the anticipated flow direction. The conductivity increases observed in the north axis wells were approximately 35-50% of the expected change. Conversely, significant increases in conductivity were observed further downgradient in the direction of flow that were also one third to one half the anticipated change. These data suggest that the high injection rates from the step test may have created some preferential flow paths along north and northeast axes and their corresponding pairs to the south and southeast. If preferential pathways were created along these lines, the initial injectate distribution may have largely bypassed the closest observation points to the east. After initial distribution along these paths, subsequent migration became controlled by the normal flow lines resulting in observation of conductivity changes in the most downgradient wells along the east.

Data reduction in December 2012 and January 2013 indicated flow velocities in the tracer test of 6-11 ft /day in the closest observation wells and 2.8-4.5 ft /day in the more downgradient wells. Groundwater elevation data for well OW-6W and MW-61 obtained in March and April of 2013 indicated a normal seepage velocity in this area of 1.0-1.3 ft/day. The inferred velocities from north axis observation points are likely skewed. Although the step tests indicated that an injection rate of 7.5 gpm could be handled by the aquifer, the inferred velocities from these close observation points are too great for proper distribution and likely resulted in preferential flow paths. The velocities indicated from wells OW-15E and OW-25E are more appropriate for proper distribution.

6.4 Source Area ABC Pilot Test Results

Alternative 4 of in the FS presented a remedial approach for the Site using ABC to enhance ongoing reductive dechlorination in the source area and down-gradient treatment areas. The biostimulation amendment used for the pilot test, referred to as ABC, is manufactured by Redox Tech, Inc. ABC consists of a special blend of lactates, glycols, esters, fatty acids, and a phosphate buffering agent.

In October 2012, three 1-inch diameter PVC injection wells were installed north of monitoring well MW-59 to facilitate the injection of Product ABC. Figure 6-1 (Appendix A) presents the location of the three injection wells designated as injection wells INJ-1, INJ-2, and INJ-3. In addition, three 2-inch diameter PVC monitoring wells (designated as PM-1, PM-2 and PM-3) were installed as shown in Figure 6-1 in order to monitor changes in the aquifer chemistry following injection. Pilot test injections were conducted at the Site on December 8, 2012. The following sections describe the implementation and performance monitoring for the pilot injection of ABC in this portion of the source area [Figure 6-1 (Appendix A)].

6.4.1 Injection Well Installation

On October 21 and 22, 2012, three 1-inch diameter PVC injection wells were installed north of monitoring well MW-59 to facilitate the injection of Product ABC. The injection wells were moved from the location proposed in the Work Plan to the area north of MW-59 based on recent monitoring results (obtained via the on-site mobile GC, see Section 5.2) from MW-81 indicating more elevated levels of TCE at that location than previously observed in the source area. Figure 6-1 (Appendix A) presents the location of the three injection wells designated as injection wells INJ-1, INJ-2, and INJ-3. The injection wells were installed using HSA drilling methods and soil sample collection procedures described in Section 5.3.2 of the July 2012 work plan. Well completion logs for the injection and monitoring wells are presented in Appendix E.

Injection Well Materials

The injection wells were constructed of 1-inch ID Schedule 40 PVC riser, 5-foot long screen (0.010-inch factory-slotted), and bottom plugs. The annular space around the screen and approximately one (1) to two (2) feet above the well screen was filled with pre-washed #5 sand. The annular space above the sand was sealed with bentonite chips and hydrated with potable water. The remaining annulus was filled with a bentonite slurry to approximately 1 foot bgs. The injection wells were completed with a 2-foot by 2-foot concrete pad surrounding an 8-inch flushmount well protector and locking expansion cap. Well completion logs for the three injection wells are presented in Appendix E.

Injection Well Development and Sampling

The newly installed injection wells were developed on October 24, 2012. During development, water quality (temperature, pH, and specific conductance) was measured and a minimum of five well volumes of water was removed. Development continued until at least five well volumes have been removed and the water quality measurements stabilized within approximately 10 percent variance over three successive measurement intervals. Development logs are presented in Appendix G.

Approximately five days following well development, groundwater samples were collected from the newly installed injection wells and analyzed at the Site by the mobile GC for select VOCs. The results of the headspace analyses performed on the water samples are presented on Table 5-2.

6.4.2 Performance Monitoring Well Installation

Performance monitoring well PM-1 was installed on October 22, 2012. Performance monitoring wells PM-2 and PM-3 were installed on November 4 and 5, 2012. Each well was constructed using 2-inch diameter PVC well material. Figure 6-1 (Appendix A) presents the locations of the three performance monitoring wells. The performance monitoring wells were located downgradient of the injection well array in order to obtain performance data following amendment injection. The performance monitoring wells were installed using HSA drilling methods and soil sample collection procedures described in Section 5.3.2 of the July 2012 work plan. Well completion logs for the performance monitoring wells are presented in Appendix E.

Performance Monitoring Well Materials

The wells were constructed of 2-inch ID Schedule 40 PVC riser, 5-foot long screen (0.010-inch factory-slotted), and bottom plugs. The annular space around the screen and approximately one (1) to two (2) feet above the well screen was filled with pre-washed #5 sand. The annular space above the sand was sealed with bentonite chips and hydrated with potable water. The remaining annulus was filled with a bentonite slurry to approximately 1 foot bgs. The monitoring wells were completed with a 2-foot by 2-foot concrete pad surrounding a 8-inch flushmount well protector and locking expansion cap. Well completion logs for the three performance monitoring wells are presented in Appendix E.

Performance Monitoring Well Development and Sampling

The newly installed performance monitoring well PM-1 was developed on October 23, 2012. Performance monitoring wells PM-2 and PM-3 were developed on November 5, 2012. During development on each date, water quality (temperature, pH, and specific conductance) was measured and a minimum of five well volumes of water was removed. Development continued until at least five well volumes have been removed and the water quality measurements stabilized within approximately 10 percent variance over three successive measurement intervals. Development logs are presented in Appendix G.

Groundwater samples were collected from the performance monitoring wells PM-1 through PM-3 on November 5, 2012. The results of the laboratory analyses performed on the water samples are presented on Table 6-3.

6.4.3 ABC Material Handling and Mixing Procedures

Prior to material delivery AMEC cordoned off an area adjacent to the injection wells for material and equipment storage using orange barricade fencing. Figure 6-1 (Appendix A) presents the staging area location. The substrate concentrate was delivered in two 270 gallon HPDE totes. For this Pilot Study, the dosage for ABC was 137 gal of ABC diluted with 957 gal of water for injection per well. In addition to the ABC, 6 gallons of concentrated AcceleriteTM, a bioremediation nutrient that enhances anaerobic microbial reductive dechlorination manufactured by JRW Bioremediation was mixed into solution. Each well received approximately 1,100 gallons of injection of fluid.

Material mixing, storage, and injection was implemented using AMEC owned injection equipment that was mobilized to the site in an enclosed single axle process trailer on December 7, 2012. The material mixing equipment consisted of a 1,500-gallon, high density polyethylene (HDPE) tank and ancillary process equipment. Figure 6-4 (Appendix A) presents the process equipment and the process flow diagram for material mixing. Pilot test injections were conducted at the Site on December 8, 2012.

Substrate concentrate was transferred to the make-up process tanks by an electrically-powered tote pump equipped with a flow totalizing meter and ancillary piping and controls. Potable water was supplied by a process water pipe located on the exterior of the facility and was connected to the mixing container by 1.5 in PVC hose equipped with a flow totalizing meter and ancillary piping and controls. AcceleriteTM was measured with a graduated cylinder and added directly into the mixing container.

All mixing and process equipment for the pilot test injection was powered by a gasoline-powered generator. Mixing of the substrate concentrate and water to generate the injectate was performed by an electrically-powered centrifugal pump. The blend tank was connected to a centrifugal pump controlled by manual switches located in the main control panel in the process trailer.

The connection from the blend tank to the injection pump was made by a combination of 1.0 in Schedule 40 PVC pipe and 1.0 in PVC hose. The discharge from the pump was connected to a distribution manifold with flow totalizing instrumentation at its inlet. The distribution manifold provides for simultaneous injection into multiple wells and has flow control valves and flow and pressure instrumentation for each of the individual branches. Sections of 1.0 in braided PVC hose rated for 150 psi service were used as the header for conveyance of the injectate to the injection well heads.

After adequate mixing, valves in the inlet line of the injection pump were opened to begin the injection operation.

6.4.4 Product ABC Injection and Monitoring Methods

The three injection wells were simultaneously injected. Each injection point received approximately 1,100 gallons of injectate delivered at a flow rate of 2.5 gpm. The flow rate was chosen after reviewing the results from the step injection pilot test to ensure adequate distribution in the matrix. Flow rates and pressures to each injection well were monitored throughout the injection process. A flow rate of 2.5 gpm was consistently maintained and no appreciable back pressure from the formation was observed.

The delivery hoses were equipped with cam lock fittings and connected to each well head assembly. Each well head assembly was constructed from Schedule 40 PVC pipe and fittings (or equivalent) and attached to each well head using cam lock fittings. Each well head assemble was equipped with a ball valve and pressure gage.

6.4.5 ABC Injection ERD Results

The Pilot ERD injection was conducted December 8, 2012. Five performance monitoring sampling events were conducted from December 28, 2012 through May 3, 2013. The performance monitoring data are presented in Tables 6-2 through 6-6.

As noted in the baseline sampling results competing electron acceptors iron, manganese, nitrate and sulfate were at very low concentrations (Table 6-5). Over the duration of the performance monitoring, nitrate was reduced from the very low baseline levels to below detection limits at MW-59(29) and PM-3. Sulfate remained above detection limits at most of the performance monitoring wells. However, significant sulfate reduction occurred at MW-59(29) and PM-1. Sulfate concentrations at PM-1 were reduced by 75% from a baseline of 7.9 mg/L to 1.9 mg/L indicating that the amendment injection was resulting in reducing conditions.

Geochemical data from performance monitoring are presented in Table 6-2. The baseline data for the ERD Pilot area indicated a mean redox potential of -61.6 mV and concentrations of dissolved oxygen from 0.06 to 0.61 mg/L. At MW-59(29), redox potential was reduced by 50% from -81 mV to -132 mV within approximately 60 days of injection and remained below the baseline level throughout the five month performance monitoring period. Dissolved oxygen was reduced to less than half of the baseline concentration within 90 days of injection and remained at those levels during performance monitoring. During the first 30 days following the injection, pH declined by approximately 1.5 units at MW-59(29). Some reduction in pH is typical following injection of an ERD amendment since the amendment contains a mixture of fatty acids and low molecular weight carboxylic acids are formed during the fermentation process. These low molecular weight organic acids release hydrogen as the electron donor driving the anaerobic dechlorination process. At MW-59(29), the pH had returned to baseline conditions within 60 days of injection.

A similar pattern of geochemical results were observed at MW-81(27) during performance monitoring. Redox potential was reduced from -65 mV to near sulfate reducing conditions (-153 mV) within 60 days of injection. Although redox potentials subsequently increased over the next three months they remained below the baseline level.

At PM-1, ORP significantly declined from -79 mV to near sulfate reducing conditions (-155 mV) within 60 days of injection. A similar decline in redox potential was also observed at PM-2. At PM-1 and PM-2 the mean redox potentials for the five months of the performance monitoring were -138 mV and -125 mV. At injection well INJ-1 redox potential was reduced from +46 mV to -51 mV. The decline in redox potential at INJ-1 is significant because of the proximity of the injection well to the pond which is a large and continual source of recharge of aerated water. The geochemical data indicate that injection of the amendment had pushed the system toward more reducing conditions.

At MW-59(29), total organic carbon (TOC) increased from a baseline concentration of 10 mg/L to 1,300 mg/L during the January 7, 2013 sampling event indicating that a significant quantity of the amendment was in the vicinity of this monitoring well within 30 days of injection. TOC concentrations subsequently declined to 33% and 15% of this peak level during the following monthly monitoring events and had returned to near baseline by May 2013. These data indicate a limited retention time with a likely maximum of 60 days for the amendment in the source area.

Sampling data at MW-59(29) in February 2013 indicated appropriate breakdown of the ethyl lactate and higher molecular weight fatty acids had occurred (Table 6-4). The concentration trends for the volatile fatty acids (VFA) at MW-59(29) were consistent with the trend indicated for TOC. Table 6-4 presents a summary of the volatile fatty acid data collected during the performance monitoring. In March, the concentrations of the breakdown products had declined to approximately half of their February levels.

TOC concentrations also reached their maximum level at MW-81(27) of 190 mg/L approximately 30 days after injection. By February 5, 2013, TOC had declined to 26 mg/L indicating a relatively rapid return to baseline levels. VFA levels peaked at MW-81(27) in February 2013 with concentrations that were generally consistent with the TOC level.

TOC and breakdown product concentrations at PM-1, PM-2 or PM-3 were not affected as a result of the pilot injection. However, TOC concentrations at the three injection wells 90 days after injection were similar in magnitude to the level observed at MW-59(29) at 30 days after injection.

Figure 6-5 (Appendix A) presents a potentiometric map for the ERD Pilot study area during December 17, 2012 which indicates that the primary flow vector in the area is toward MW-59. A potentiometric map for the area from March 4, 2013 (Figure 6-6) also indicates that the primary component of flow is toward the southeast toward MW-52 and MW-59. Prior to the pilot study, determination of groundwater flow direction in the source area was based on data from wells MW-59(29) and monitoring wells beneath the building (MW-68 and MW-76) which indicated a more easterly flow direction. As indicated in Figures 3-14 and 3-15, the gradient flattens and groundwater flow direction becomes more easterly between MW-59(29) and the building. However, groundwater flow in the pilot area is strongly influenced by the pond and in its immediate vicinity has a much higher gradient and a more southeasterly component of flow. The TOC data from the pilot study correlate with the groundwater flow pattern since a more of the amendment mass would have been advectively transported along the primary flow component.

Prior to the pilot test, estimation of groundwater velocity in this area had also been based largely on MW-59(29) and wells beneath the building. Based on groundwater elevation data from December 2012 and March 2013, seepage velocities from INJ-1 to MW-59 range from 4.06-5.13 ft/day. Mean seepage velocities from INJ-1 to PM-1 and PM-2 were 5.6 ft/day and 3.43 ft/day. Conversely, seepage velocities from INJ-2 and INJ-3 to PM-3 ranged from 0.32 ft/day to 1.03 ft/day.

Figure 3-3 (cross section B- B') provides an west to east cross section for the injection and observation wells in the pilot area. As indicated in Figure 3-3 (and in the soil boring log for PM-1), monitoring well PM-1, located approximately 10 ft east of INJ-1 has the majority of its screened interval in a sand with a high silt content. In conjunction with the local groundwater flow patterns, this less permeable lense also contributed to preferential transport of the amendment to MW-59 and MW-81 and the lack of increased TOC at monitoring points PM-1 through PM-3. Since this lense is at the same elevation as the injection interval, much of the amendment injected into INJ-1 was deflected to the southeast toward MW-59 and to a lesser extent to the northeast toward MW-81, respectively. Due to the high flow velocities in the area, it is likely that amendment injected at INJ-1 was sufficiently deflected and transported away from both PM-1 and PM-2 so that it was not observed at these locations.

Performance monitoring well PM-2 was intended to be the furthest downgradient observation point for amendment injected at INJ-1 since it was located at the estimated maximum extent of downgradient influence. As such, it was not expected to be influenced significantly by amendment injected at INJ-2 or INJ-3. As indicated in Figure 3-2 (cross section A-A'), a portion of the screened interval of INJ-2 is within a silt lense which likely further reduced the potential that PM-2 would be influenced by amendment injected at that point. Amendment injected at INJ-3 would have been transported to the east and southeast due to the localized flow vectors and high seepage velocity and would not have been observed at PM-2. Monitoring well PM-3 located approximately 45 ft downgradient from INJ-2 and INJ-3 was installed as the terminal observation point for the pilot test to evaluate if influence from the injection would be observed at that downgradient distance. The lack of appearance of amendment at PM-3 is consistent with observations in the tracer tests and the decreased groundwater velocities between PM-2 and PM-3.

Although an increased level of TOC was not observed at PM-1 through PM-3, the injection wells had elevated concentrations of TOC approximately 90 days after the pilot injection. The most elevated TOC levels were found at INJ-2 (3,900 mg/L). As indicated, a significant part of the screened interval for INJ-2 is within a silt lense. Elevated TOC levels were also observed at INJ-1. Although INJ-1 is not screened within a silt lense, such a feature is in relatively close proximity of that injection well. The elevated TOC levels found in groundwater samples from the injection wells several months after injection indicate some adsorption of the fatty acid fraction of the amendment on the silt lenses. Where such adsorption occurs, this will provide a beneficial effect of a sustained low concentration release of the electron donor. Monitoring points screened in the sands with high silt content, such as PM-1, did not exhibit any significant increase in TOC suggesting limited penetration of the amendment into the silt rich sands. Conversely, pilot monitoring wells screened in the sands such as MW-59(29) indicated relatively rapid transport and limited residence of the amendment in that lithology. These data indicate that non-uniform distribution of amendment is likely to occur and that phenomena will be exacerbated where flow velocities are greater.

As indicated the data suggest that a significant amount of the amendment was deflected toward MW-59(29) and changes in the VOC concentrations at that well strongly indicate that reductive dechlorination occurred. The concentration of cis-1,2-DCE declined by 60% within 90 days of injection. During this time vinyl chloride concentrations increased in a corresponding fashion. TCE was not detected but cis-1,2-DCE concentrations subsequently increased by approximately 8,000 µg/L suggesting that parent compounds were being rapidly desorbed from the matrix and dechlorinated or that cis-1,2-DCE desorbed from the matrix. Overall vinyl chloride concentrations approximately doubled in 90 days. Additionally, ethene concentrations increased six fold to a very elevated level (9,600 µg/L) within 90 days of injection indicating the formation of 285 µmols of end product. During this period, methane concentrations remained stable. These data indicate rapid reductive dechlorination to completion in the area that received the majority of the amendment.

Monitoring well MW-81(27) was the only monitoring point with significant TCE concentrations during baseline sampling. Within 30 days of injection, TCE concentrations had declined by approximately 33% even though TOC levels were never significantly elevated at this well. At 60 days after injection, cis-1,2-DCE concentrations had increased by 25% indicating that rapid dechlorination of the parent compounds was occurring. The increase in the TCE concentration 60 days after injection indicate that desorption of the parent compounds from the matrix was occurring. Vinyl chloride concentrations also doubled within 60 days of injection but ethene production did not significantly increase indicating that dechlorination at this location may have stalled at vinyl chloride due to the limited supply of the electron donor.

At PM-1 TCE declined from 72 µg/L to below detection levels within 30 days of injection. The concentration of cis-1,2-DCE declined 40% within 60 days of injection before rebounding to 125% of the baseline concentration. A corresponding increase in parent VOC was not observed concurrent with the rebound in the cis-1,2-DCE concentration which indicates its desorption from the aquifer matrix. A notable increase in vinyl chloride concentrations also occurred within 30 days of injection but did not correlate directly with the changes in the DCE concentration. Vinyl chloride concentrations remained relatively stable as cis-1,2-DCE concentrations subsequently rebounded. Additionally ethene levels did not change appreciably at PM-1. This data suggests that the amendment improved matrix desorption and that some dechlorination occurred but that reduction was limited due to the limited supply of electron donor.

At PM-2, TCE levels declined 67% within 30 days of injection and had been reduced to 15% of the baseline concentration within 90 days of injection. Cis-1,2-DCE and vinyl chloride concentrations declined by approximately 33% in a relatively consistent manner over a period of 90 days following injection. An appreciable increase in ethene concentrations was not observed at PM-2, suggesting that dechlorination was proceeding to completion even with the limited electron donor supply.

Although only very limited results were expected at PM-3, TCE declined to below detection limits within 30 days of injection. Cis-1,2-DCE concentrations increased somewhat for the first 90 days after injection but an overall decrease was observed by the end of the performance monitoring period. Vinyl chloride concentrations increased by about 30% in the initial 60 days after injection. cis-1,2-DCE and vinyl chloride concentrations at PM-2 declined during the time their concentrations increased at PM-3 indicating some desorption of DCE from the matrix upgradient of PM-3 followed by dechlorination. Ethene concentrations did not reflect complete degradation.

DHC populations at the monitoring wells increased by one to three orders of magnitude following injection. The DHC populations observed in the March 2013 sampling event were within the appropriate range for complete dechlorination to occur.

6.5 ISCR Pilot Test Results

In addition to enhanced reductive dechlorination, the preferred alternative from the FS involved the use of in-situ chemical reduction at the downgradient edges of the source area and down-gradient treatment zones. In-situ chemical reduction involves the synergistic effects of anaerobic reductive dechlorination in combination with direct chemical reduction by metals and is achieved by the co-injection of a carbon source and ZVI. The amendment used for the pilot test, referred to as ABC+, is manufactured by Redox Tech, Inc under license from Adventus. Redox Tech and Adventus hold patent rights for ISCR amendments.

ABC+ is a mixture of microscale ZVI blended with ABC (a special blend of lactates, glycols, esters, fatty acids, and a phosphate buffering agent).

In October 2012, ABC+(also referred to as ZVI in this plan) was injected in the ISCR pilot test Area located in the vicinity of MW-26 (Figure 6-2 Appendix A). Three borings and two monitoring wells were subsequently installed downgradient from the injection zone to obtain information with respect to the distance that the amendment propagated and the overall effects of the injections. The following sections describe the implementation and performance monitoring of the pilot injection of ABC+ in the ISCR Pilot area.

6.5.1 ABC+ Injection

In October 2012, Redox Tech injected ABC+ into eight locations along two rows spaced approximately 15 ft apart and aligned transverse to the local groundwater flow direction. ABC+ was also injected in two additional borings (ZVI-INJ-9 and ZVI-INJ-10) located between these two primary rows as shown in Figure 6-2. A total of approximately 35,900 lbs of ABC+ (26,400 lbs ZVI, 9,500 lbs ABC) was injected as 17,600 gallons of slurry in these ten locations. At each location except ZVI-INJ-9 and ZVI-INJ-10, two boreholes were used for deep and shallow emplacement of the amendment. Injections were conducted from approximately 45 ft bgs to 10 ft bgs in a bottom up method over successive 3 ft intervals. Each location received approximately 1,760 gal of amendment which was injected at pressures of approximately 100 psi. No problems were encountered except during injection at ZVI-INJ-8. During injection in the shallow interval at that location amendment surfaced at nearby MW-16.

6.5.2 Investigation Boring and Monitoring Well Installation

In December 2012, three investigation borings and two, 2 in diameter monitoring wells nests designated ZVI-1 and ZVI-2 were installed to obtain performance data following amendment injection. Performance monitoring well nest ZVI-1 was installed on December 2, 2012. Performance monitoring well nest ZVI-2 was installed on December 3 and 4, 2012. Each well was constructed using 2-inch diameter PVC well material. Figure 6-2 (Appendix A) presents the locations of the two performance monitoring wells. The performance monitoring wells were installed using rotosonic drilling methods and soil sample collection procedures described in Section 5.3.2 of the July 2012 work plan. Well completion logs for the performance monitoring wells are presented in Appendix E.

Soil Boring Installation

To confirm horizontal propagation of the ZVI, continuous core samples were collected at three locations at varying distances from injection points after addition of the amendment. The locations of the soil borings (B86, B87, B88),) are presented on Figure 6-2 (Appendix A). The soil cores were collected using Rotosonic™ drilling methods and visually inspected for the ZVI amendment to depths ranging from 0 to 59 feet bgs. In addition to evaluating for horizontal propagation, the soil cores were inspected for consistent vertical propagation in order to evaluate the effectiveness of the injection methods utilized at the Site. The core samples were photographed in the field and the details were noted on the soil boring logs in Appendix E.

Based on visual observation of the core samples, ZVI seams were apparent within silt but were not apparent within the samples that consist primarily of sand. Horizontal propagation of ZVI extended beyond soil boring ZVI-1, which is approximately 12 ft from the edge of the injection array. ZVI was observed at 22 ft from the edge of the injection array within a silt layer. In addition to horizontal propagation, vertical propagation occurred in the study area as ZVI was observed in a silt layer approximately 47 feet deep at soil boring B-87 location. Figure 6-2 presents the location of soil boring B-87 which is approximately 10 feet from the injection array.

To evaluate iron content within the sand formation, select soil samples consisting of 1.5 to 3 ft of boring material were collected from locations within the 10 ft Rotosonic cores and submitted to a laboratory for total iron analyses. The results of the total iron analyses are presented on Table 6-6. In addition, these samples were also analyzed for TOC and TOC results are presented on Table 6-6 as well. A copy of the laboratory report is presented in Appendix F.

Performance Monitoring Well Materials

The wells were constructed of 2-inch ID Schedule 40 PVC riser, 5-foot long screen (0.010-inch factory-slotted), and bottom plugs. The annular space around the screen and approximately one (1) to two (2) feet above the well screen was filled with pre-washed #5 sand. The annular space above the sand was sealed with bentonite chips and hydrated with potable water. The remaining annulus was filled with a bentonite slurry to approximately 1 foot bgs. The performance monitoring wells were completed with a 2-foot by 2-foot concrete pad surrounding a 8-inch flushmount well protector and locking expansion cap. Well completion logs for the two performance monitoring well nest presented in Appendix E.

6.5.3 Monitoring Well Development and Sampling

The newly installed monitoring wells [ZVI-1(16.5), ZVI-1(34.5), ZVI-2(17.5), and ZVI-2(32.5)] were developed on December 4 and 5, 2012. During development, water quality (temperature, pH, and specific conductance) was measured and a minimum of five well volumes of water was removed. Development continued until at least five well volumes have been removed and the water quality measurements stabilized within approximately 10 percent variance over three successive measurement intervals. Development logs are presented in Appendix G.

On December 18, 2012, groundwater samples were collected from the newly installed monitoring wells. The results of the laboratory analyses performed on the water samples are presented on Table 6-2 through 6-5.

6.5.4 ABC+ Injection Results

The Pilot ISCR injections were conducted October 29-31, 2012. Five performance monitoring sampling events were conducted from December 18, 2012 through May 3, 2013. The performance monitoring data are presented in Tables 6-2 through 6-5.

As noted in the baseline sampling results, competing electron acceptors iron, manganese, and nitrate were generally at very low concentrations (Table 6-5). Over the duration of the performance monitoring, nitrate concentrations remained unaffected. Iron concentrations increased significantly at MW-16 from 0.15 mg/L to 27 mg/L over the five month performance testing period. Iron concentrations at MW-26(28.8) increased to a lesser extent from 0.15 mg/L to 6.7 mg/L over the five month period. Soluble manganese concentrations increased by an order of magnitude at these wells during performance monitoring.

Sulfate concentrations at MW-16 were reduced by 20% during performance monitoring. More notably, sulfate concentrations were reduced at MW-26(28.8) by more than 95% to below detection levels at 60 days after injection. Sulfate concentrations had rebounded to 5.1 mg/L by the end of performance monitoring.

At both MW-16 and MW-26(28.8), increased iron and manganese concentrations and reduced sulfate concentrations correlate with an increase in the TOC levels. At MW-16, TOC levels increased from 1.7 mg/L to 43 mg/L over the five months of monitoring. At MW-26(28.8) TOC increased from 1.1 mg/L to 240 mg/L before declining to 140 mg/L. The lowest concentration of sulfate corresponded with the highest TOC concentration in January 2013. Iron and manganese were not quantified in January 2013 when the highest TOC levels were observed but the highest level of soluble iron was observed in December 2012. Additionally, elevated iron and manganese levels were observed four to five months after injection and TOC remained somewhat elevated at these events. Overall, the data from MW-16 and MW-26 indicate the establishment of iron to sulfate reducing conditions at these wells.

Monitoring points ZVI-1 and ZVI-2 were installed after completion of the injections. Monitoring point ZVI-1 is located approximately 12 ft downgradient from the edge of the ZVI injection array along the primary groundwater flow vector. The initial data for these wells was obtained December 18, 2012. The initial data from the shallow interval of ZVI-1 indicated very elevated concentrations of iron (23 mg/L) and manganese (5.7 mg/L). Significant concentrations of iron (15 mg/L) and manganese (0.77 mg/L) were also observed in the deep interval of ZVI-1(34.5) during the initial sampling event. These very elevated levels of iron and manganese at ZVI-1 corresponded with the maximum observed levels of TOC at this well. In subsequent monitoring events, TOC declined at both intervals at ZVI-1 and both iron and manganese concentrations declined.

Iron and manganese concentrations at ZVI-2 exhibited a similar trend that was not as well correlated with TOC. In the deeper interval at ZVI-2(32.5), the maximum TOC, iron and manganese concentrations were observed during the December sampling event. Over the next five months, concentrations of TOC declined and the concentrations of iron and manganese also decreased. Manganese exhibited a similar correlation with TOC in the upper interval of ZVI-2(17.5) but iron concentrations fluctuated as TOC declined. However, a significant increase in TOC concentration was not observed at the upper interval of ZVI-2.

Groundwater flow in the ISCR pilot area is to the southeast. Seepage velocities in the area are relatively high (1.25 to 1.55 ft/day). The data for metals and sulfate suggest that the ABC or more soluble fractions of the ABC co-injected with the iron migrated downgradient from the injection zone relatively rapidly. Monitoring point ZVI-1, approximately 15 ft from the injection array in the direction of groundwater flow exhibited the most notable increase in iron and TOC among the pilot monitoring wells. This notable increase in TOC and iron concentrations was observed approximately one month after injection. After the initial pulse the more soluble fractions of ABC were transported downgradient from ZVI-1, TOC levels declined and conditions became less amenable to iron reduction resulting in declining soluble iron concentrations.

These conditions or trends were also evidenced at ZVI-2 but were less significant in strength because that monitoring point is approximately 22 ft downgradient along the primary flow path, MW-26 is directly aligned along the primary groundwater flow vector with only the injection points on the western side of the array (ZVI-INJ-4, ZVI-INJ-8 and ZVI-INJ-10). As such, effects related to advective transport of soluble amendment would be expected to be less notable at MW-26 since its location makes it tangential to the majority of the flux passing through the injection array. However, the maximum soluble iron concentrations at MW-26 occurred in December 2012 when TOC levels were not quantified and therefore the trends noted at ZVI-1 and ZVI-2 may have also occurred at MW-26 but were not detected.

During the December 2012 sampling event, total iron in the upper interval of ZVI-1 was detected at 23 mg/L but ferrous iron was detected at 6.0 mg/L. A similar difference between total and ferrous iron was observed at the deeper interval of ZVI-1. Over the duration of the monitoring program, the difference between soluble iron and total iron at ZVI-1 declined. In general, a significant difference in these parameters did not occur at the other monitoring locations. These data suggest that zero valent iron was propagated from the injection array to at least the distance of ZVI-1.

Geochemical data from performance monitoring are presented in Table 6-2. At MW-16, redox potential declined from -21 mV in baseline sampling to -124 mV at the end of the five month performance monitoring period. Dissolved oxygen remained at approximately the baseline level during performance monitoring.

At MW-26(17.5), redox potential declined from a baseline level of -32.4 mV to -108 mV in May 2013. This decline in redox potential was observed even though TOC levels were not significantly elevated at this interval in this well. Redox potential in the deeper interval of MW-26 declined from a baseline of 204 mV to -71.4 mV in January 2013 when the maximum TOC level was observed. Although TOC levels subsequently declined, the redox potential remained near the level associated with the maximum TOC concentration. The relatively consistent negative ORP levels as TOC concentrations declined are indicative of reducing conditions being maintained by the injected ZVI.

In the upper interval of ZVI-1(16.5), redox potential declined from -106 mV to -170 mV as TOC declined from 510 mg/L to 34 mg/L. A similar trend was noted in the deep interval of ZVI-1 and both intervals at ZVI-2. These conditions strongly indicate that reducing conditions were being maintained by the injected ZVI. In both intervals at ZVI-1, pH increased by between 0.5 and 1.0 SU. This range of pH increase is typical following injection of ZVI and results from the reaction of the iron with water and oxygen liberating hydrogen gas and creating iron hydroxides.

At monitoring well MW-16, TCE concentrations declined by approximately 53% even though TOC levels were not significantly elevated at this well. At approximately five months post injection, cis-1,2-DCE concentrations had increased by 15% but vinyl chloride concentrations had doubled indicating that reductive dechlorination by hydrogenolysis was predominant over the beta elimination pathway.

At MW-26(17.5), the limited amount of TCE observed in baseline sampling was reduced to below detection limits within two months of the pilot injection. The concentration of cis-1,2-DCE significantly increased by 55% indicating matrix desorption was occurring. Vinyl chloride concentrations increased in a corresponding fashion indicating that reductive dechlorination along the biological pathway was predominant. Vinyl chloride also doubled within five months of injection.

At MW-26(28.8), TCE concentrations declined from 22 µg/L to 1.9 µg/L (91%) over the duration of the performance monitoring period. Concentrations of cis-1,2-DCE increased by an order of magnitude within two months of injection (45 µg/L to 480 µg/L). Vinyl chloride concentrations in the deep interval of MW-26(28.8) increased with the cis-1,2-DCE concentrations in a corollary fashion. These data indicate that significant matrix desporption followed by reductive dechlorination occurred in the vicinity of MW-26. However very limited ethene was observed at MW-26 indicating that dechlorination did not proceed to completion due to the declining TOC levels.

At ZVI-1(16.5), TCE declined from 3.5 µg/L to below detection levels within 90 days of injection. The concentrations of cis-1,2-DCE and vinyl chloride fluctuated and did not exhibit any significant decline in concentration which likely reflects the rapid transport of the soluble ABC fractions from this well. Although cis-1,2-DCE and vinyl chloride concentrations fluctuated, production of ethene did occur. In the deeper interval, TCE concentrations declined by 70% within the performance monitoring period. Concentrations of cis-1,2-DCE and vinyl chloride initially declined then rebounded in this interval. Ethene production was very limited in the lower interval because there was not significant growth in the DHC population in this interval. It should be noted that TCE concentrations did decline significantly with limited TOC and with rebounding concentrations of ERD daughters which suggests that beta elimination was responsible for the TCE decline.

At ZVI-2(17.5), the TCE, DCE and vinyl chloride levels exhibited trends similar to those noted in the deeper interval of ZVI-1. However, there was some ethene production and the DHC population increased significantly suggesting both pathways were involved. At ZVI-2(32.5), TCE concentrations declined from 16 µg/L to below detection over the duration of the performance monitoring period. Significant increases in the concentrations of cis-1,2-DCE and vinyl chloride were observed that indicated matrix desporption followed by reductive dechlorination was occurring. Some limited ethene production was observed but the levels indicated that dechlorination did not proceed to completion due to the declining TOC levels.

DHC populations at ZVI-1 and ZVI-2 increased by two to four orders of magnitude following injection. With the exception of the deeper interval at ZVI-1, the DHC populations observed in the May 2013 sampling event were within the appropriate range for complete dechlorination to occur.

6.6 Sub-Slab Vapor Depressurization Pilot Test Results

6.6.1 Summary of Indoor Air Investigation and Recommendations

Indoor air samples collected in the Plant during the Phase 2 FSI suggest that vapor intrusion is not a risk to Plant workers. However, based on the sub-slab soil vapor concentrations detected at one or more test locations, sub-slab depressurization (SSD) or vapor extraction was recommended to mitigate vapors beneath the sub-slab in connection with source area treatment.

Based on the results of the sub slab vapor sample testing performed in 2010 and 2011 beneath the Plant floor, low-flow vapor extraction at several locations would be initiated prior to and during the biostimulant and ISCR injections since sub-slab daughter VOC vapor concentrations may increase upon implementation of source area treatment. The SSD system would be a conservative measure protective of industrial workers until source area concentrations are reduced through remediation.

6.6.2 December 2012 SSD Pilot Tests

Extraction Well/Vapor Point Configuration and Installation

In order to conduct sub-slab communication testing, a temporary sub-slab extraction well and multiple vapor monitoring points were installed at the Plant near monitoring well MW-72 in December 2012. The extraction well was fitted with a 4-inch diameter PVC pipe and 0.01-inch slotted screen approximately 6 inches long. To facilitate the installation of the extraction well, a 12-inch diameter concrete core was removed from the floor using a concrete coring machine. Once removed, the sub-base granular material (sand) beneath the cored location was removed to a depth of approximately 14 inches bgs. Approximately 2 inches of sand pack was added to the excavation prior to installing the well. The well (open bottom) was then installed on top of the sand pack with the screen portion directly beneath the slab. Sand pack was used to backfill around the screen. The annulus between the well casing and slab was sealed with hydrated granular bentonite. Figure 6-7 (Appendix A) presents the location of the temporary vacuum extraction well VE-1.

Sub-slab communication testing was performed by measuring the differential vapor pressure between the sub-slab soil and the Plant. Approximately ten feet from the extraction well, AMEC installed an array of temporary vapor points by drilling a 1/2-inch diameter hole through the slab and sealing in a ¼-inch OD polyethylene tube within the hole using bentonite sealing materials. Figure 6-7 (Appendix A) presents the location of the temporary vapor points that are equally spaced approximately 15 feet apart.

In addition to monitoring the temporary vapor points, existing sub-slab vapor probes VP-1 through VP-6 were used as vapor monitoring points.

Following extraction well and vapor point installation, AMEC connected the extraction well to a Rotron 303 regenerative blower using PVC 40 pipe and fittings. The discharge of the blower was passed through a gas phase activated carbon polisher. Discharge line from the polisher was routed outside of the Plant.

Sub-Slab Communication and Vacuum Extraction Testing

Sub-slab communication testing was performed during a period of limited Plant activities to minimize wind driven transport. Prior to testing, Plant doors, windows, and ventilators were also closed to minimize wind driven transport. Differential pressures between the sub-slab and the Plant were recorded at each vapor probe/point location prior to the extraction test and during the extraction of vapors using a manometer capable of measuring a 0.001 inch of water column (WC) change. In addition to using the manometer, each vapor point location was connected to magnehelic gauges for recording differential pressure in inches WC.

Baseline differential pressures were measured from the vapor points prior to extraction activities. Table 6-7 presents the results of the sub slab differential pressure readings. At each vapor point, a positive pressure was recorded, between the subsurface and the Plant which the indicates potential for vapors to migrate from beneath the slab to indoors. Since indoor air surveys indicated concentrations below risk levels, direct communication is impeded by the low-permeable concrete pad.

The purpose of the individual tests was to document optimum vapor flow conditions within the soil beneath the slab. For each step, vacuum and flow at the slab extraction point and vacuum response at each vapor monitoring point was be recorded. The first test was performed at 5-inches WC at the extraction point. Subsequent testing was performed at 10, 20, 23 and 40 inches WC. Each test lasted approximately 30 minutes with a lull of at least 10 minutes between tests to allow or equilibrium conditions. Differential pressures at the vapor monitoring points were monitored and compared to pre-extraction measurements for confirming equilibration between tests. Measurements recorded during the step tests are presented on Table 6-7.

VOC Emission Testing

AMEC collected two vapor samples during the December 2012 pilot testing for estimating VOC emissions during the pilot test to determine if vapor phase treatment will be required with a sub-slab depressurization system. During the first and last tests, a grab sample of air from the suction side of the blower was collected using pre-cleaned, evacuated, 6-liter, stainless steel Summa® canisters. The Summa® canisters were submitted, under chain of custody, to ALS Laboratory Group in Cincinnati, Ohio, for analysis for VOCs using EPA Method TO-15. Table 6-8 (Appendix B) presents the results of the vapor analyses for select compounds. Compounds tested for and the results of the analytical testing performed on the vapor samples are presented on the laboratory reports. A copy of the laboratory reports are presented in Appendix J.

6.6.3 Wall and Column Footer Evaluation

To assist in the design of the SSDS, AMEC attempted to obtain as-built drawings for the Plant. AMEC reviewed multiple engineering drawings of the facility, but none of the plans provided detail of the column supports and interior wall supports. On June 25, and June 26, 2013, AMEC personnel performed intrusive inspections at two column footings and three interior wall footings within the Plant. The assessment was performed using a rotary hammer drill and a 5/8-inch diameter concrete bit to assess for footer dimensions surrounding the column post and at interior walls. In addition, at each location, a 12-inch diameter core was removed from slab floor using a concrete coring machine to visually inspect the footers. Backfill beneath the 12-inch core was excavated by hand to approximately 20 inches at the assessed locations. This assessment was performed at locations pre-selected for potential extraction sump locations. These locations are identified by Plant stations designated as B21, D23, F19, F21, and H21. Figure 6-7 presents the Plant station locations. Details of the footers are shown on five cross-sections that were developed for each station based on the findings of this assessment and the visual inspections. Figures 6-8 through 6-12 (Appendix A) presents the cross-sections for Plant stations B21, D23, F19, F21, and H21.

6.6.4 Additional Extraction Well Installation

Within the 12-inch diameter slab openings at Plant stations B21, D23, F19, F21, and H21, a temporary sub-slab extraction well was installed to facilitate extraction testing at each location. The extraction well consisted of a 4-inch diameter PVC pipe fitted with a 0.01-inch slotted screen approximately 6 inches long. Prior to installation, the footer assessment excavations were backfilled with washed pea gravel to approximately 14 inches bgs. The well (open bottom) was then installed on top of the pea gravel with the screen portion directly beneath the slab. Additional pea gravel was used to backfill around the screen. The annulus between the well casing and slab was sealed with hydrated bentonite/concrete slurry. Figure 6-7 (Appendix A) presents the location of the vacuum extraction wells.

6.6.5 Additional Sub-Slab Communication and Extraction Well Testing

At each footer assessment location, sub-slab vapors were extracted for approximately 10 minutes in order to obtain additional data for final SSDS design. The additional extraction well testing was completed to provide a more comprehensive data set and to evaluate the small radius of influences recorded during the December 2012 pilot test.

Using a 6.5 horsepower shop vac, vacuum was applied at each of the five test locations. Prior to initiating extraction at each location, differential pressures between the sub-slab and the Plant were recorded at one or more permanent sub-slab vapor probes (VP-1 through VP-7). Measurements were recorded prior to the extraction tests and during the extraction tests using a manometer capable of measuring a 0.001 inch of water column (WC) change. Table 6-7 presents the results of the sub-slab differential pressure readings. At each measured vapor probe location, a positive pressure was recorded.

Vacuum extraction conducted at the five test locations were conducted at vacuum levels ranging from 11 inches WC to 29 inches WC. Differential pressures at select vapor monitoring probes were monitored and compared to pre-extraction measurements for confirming equilibration between tests. Measurements recorded during the tests are presented on Table 6-7.

6.6.6 Radius of Influence Testing

Data collected during the December 2012 and June 2013 vapor extraction tests were evaluated for radius of influence (ROI) and sufficient vacuum beneath the sub-slab to address the area above the treatment zone.

During the December 2012 pilot test, negative vacuum was only measured in vapor points TP-1 and VP-6, which were located within 15 feet of temporary extraction well VE-1. The next closest point (TP-2) was approximately 30 feet from VE-1 where negative pressure readings were not sustained. Based on the lack of negative vacuum measured during the December 2012 test, additional tests at multiple locations were suggested and were conducted following the footer assessment activities.

In June 2013, as described in Section 6.6.5 and 6.6.6, additional extraction testing was conducted at five locations within the Plant. During the test, negative pressure was measured at one or more of the existing vapor probes that were monitored. Vapor probes monitored in June 2013 included VP-1, VP-2, VP-5, and VP-6.

Vacuum data collected at each vapor monitoring point during each test were tabulated and plotted on a graph. Using graphical methods (Nyer, 2001) by plotting the observed vacuum against the radial distance from the extraction well and a vacuum (0.058) sufficient enough to overcome the highest winter background reading (0.054) plus the design goal of 0.004, the effective ROI was calculated at each extraction location. The calculated ROIs for each test are shown on graphs presented in Appendix K.

6.7 Sub-Slab Pilot Test Analyses and Recommendations

6.7.1 Sub-Slab Communication

A positive pressure was measured at each vapor probe location prior to conducting sub-slab vapor extraction in December 2012 and June 2013. With sub-slab pressures greater than zero, there is a potential for vapors to migrate through voids in the Plant floor. Based on visual observations, the Plant floor appears to be a good shape and did not have any noticeable cracks in the visible areas of the floor. The concrete floor has been painted with an epoxy coating, thus reducing vapor migration into the interior of the Plant.

During pilot test extraction, the subsurface soil vacuum resistance ranged between 11 and 40 inches of WC at flows less than 130 scfm. The preferred vacuum level for SSD operations is the lowest level possible in achieving negative vacuum readings beneath the sub-slab. The ideal vacuum level based on the findings of the pilot test is approximately 11 inches WC.

Based on the results of the June 2013 sub-slab communication testing, extracting soil vapor at approximately 11 inches WC produces an effective ROI of at least 41 feet. An effective ROI is one that provides a negative vacuum reading that will overcome positive winter background readings. The graphs presented in Appendix K show effective ROI at each tested location using a conservative “Y” value of 0.058 inches WC.

6.7.2 Sub-Slab Footer Assessment

Based on the findings of the footer assessment, the east interior wall that separates the Plant operations area from office space provides limited impedance to vapor flow. The same result was true for the column footers. The central west interior wall along the forklift aisle and the west interior wall that separates the Plant operations area from the laboratory and office space causes impedance to soil vapor as the footer depths extend greater than 20 inches below the floor.

6.7.3 Vapor Flow

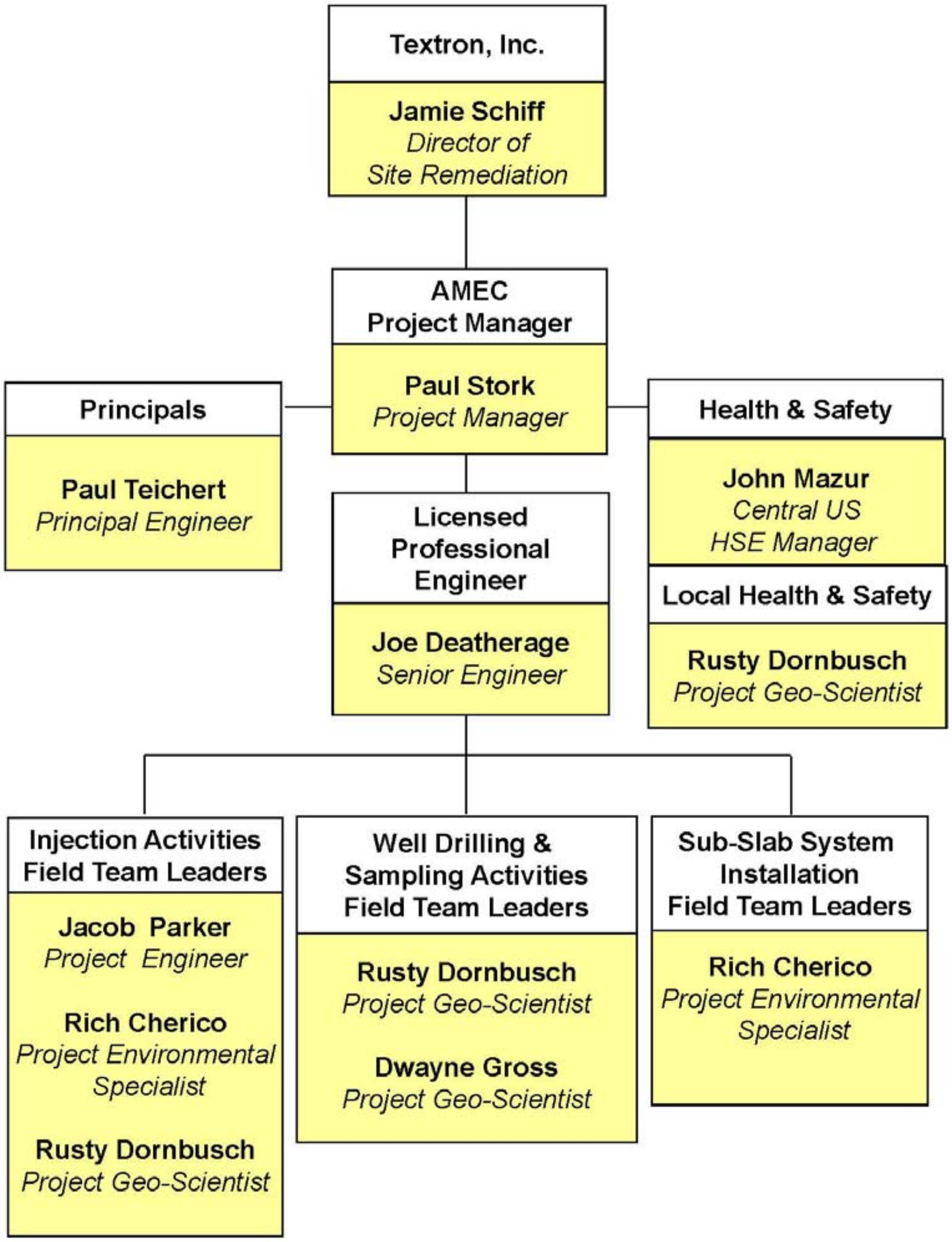
Vapor flow measured during the pilot tests ranged between 8.9 and 121 scfm. Where more permeable subsurface material was observed during the installation of the extraction wells, a greater flow was observed during the extraction well test.

6.7.4 Vapor Emissions

Based on the results of the laboratory analyses performed on the vapor samples collected on December 18, 2012, hazardous air pollutants (HAPs) emitted were less than permit thresholds. Based on the low-level detection of HAPs and other VOCs, vapor treatment options are not being considered for vapors to be discharged to the atmosphere.

7.0 STATEMENT OF WORK

This section of the RWP describes the remedial objectives and proposed schedules. The following is a Textron and AMEC organizational chart for the Site work described in this Work Plan.



7.1 Source Area Groundwater Remediation Approach

The objective of source area remediation is to reduce the mass of VOCs in the source area groundwater to demonstrate that the downgradient plume concentrations are declining or stable. A breakdown of the activities to meet that objective is detailed below:

- Analyses of vertical and horizontal extent of VOCs to be targeted for treatment and incorporate into this RWP.
- Calculate horizontal and vertical propagation of fluids to be injected based on the results of the pilot study.
- Installation of injection wells at desired locations based on the results of pilot testing. Installation of additional injection wells if deemed necessary based on soil lithology findings during initial injection well installation.
- Design and setup of chemical mixing and staging areas to facilitate multiple injections.
- Analyses of injection fluids and volumes to be used for Round 1 of full-scale implementation. Sustain or modify subsequent injection blends based on performance monitoring results.
- Continuation of injection activities as needed until favorable redox conditions are present and VOCs have decreased and appear to be on the pathway of complete reductive dechlorination.
- Implement performance groundwater monitoring to evaluate whether additional injections are required.
- Cease performance groundwater monitoring and begin stability monitoring when plume concentrations at perimeter of compliance wells (POC) have reached stable or decreasing concentrations.
- Cease stability monitoring when plume concentrations at perimeter of compliance wells (POC) and sentinel wells have reached a stable or decreasing concentrations through use of stability monitoring and quantitative and temporal analyses of the data.
- Submittal of Record of Closure form to IDEM to cease remediation activities.

7.1.1 Scope of Work

The following activities will be completed as part of full-scale source area groundwater remediation implementation:

- Prepare Health and Safety Plan

- Obtain UIC permit exemptions
- Install injection wells and complete soil lithology profiling
- Survey injection well locations
- Set up product staging areas, product handling and mixing procedures
- Implement injections at the designated areas
- Repeat injections as needed every 90 to 180 days
- Complete performance monitoring of groundwater parameters
- Performance evaluation (reporting)

7.1.2 Contractor Information

AMEC is in the process of soliciting bids from drilling contractors to install the injection wells. Following evaluation of the bids and contractor selection, AMEC will select a drilling contractor based on price, site experience, technical capabilities, and availability.

AMEC plans to contract Territorial Engineering LLC (Territorial) in Walkerton, Indiana to survey horizontal and vertical control coordinates of the newly-installed injection wells. Territorial has performed survey work at the Site since 2009.

AMEC's drilling activities will be directed by Mr. Paul Stork under the review of Mr. Joe Deatherage. Field team leaders for AMEC (listed in Section 7.0) will be responsible for oversight, soil and groundwater data collection and sampling, if deemed necessary. If any sampling is to be performed, sampling procedures will follow the guidelines presented in the QAPP which is located in Appendix N.. Mr. Stork has over 20 years experience in the performance of subsurface investigations and well installations in glacial terrains. Mr. Deatherage is a licensed engineer in the State of Indiana and has extensive experience pertaining to environmental subsurface investigations and remediation of chlorinated hydrocarbon plumes.

Following injection well installation, AMEC will self implement the injections of Product ABC at the source area under the direction of Mr. Paul Teichert, Principal Engineer with AMEC.

7.1.3 Schedule

Well installation activities will begin within four weeks of IDEM approving this RWP. AMEC anticipates that the drilling and well installation activities for the source area will require approximately 140 calendar days to complete. A proposed schedule detailing the specific activities is present in Appendix L.

7.2 Source Area Product ABC+ Reaction Zone Remediation Approach

The main objective for the Product ABC+ reaction zone adjacent to the Western Pond behind the Plant is to provide a zone that will be long lasting and address the VOCs identified in this area of the Site.

The combination of controlled release of organic carbon to stimulate anaerobic biodegradation and direct reduction via ZVI is designed to drive aquifer geochemistry to a very reductive environment.. In order to degrade cis-1,2-DCE and VC anaerobically, a very reductive environment is required. The primary pathway for ISCR is through beta elimination (abiotic degradation processes), whereas TCE is reduced to chloroacetylenes instead of cis-1,2-DCE and VC, the daughter products that are generated through the reductive dechlorination process. Although this is the primary pathway for the transformation of TCE, a low percent (i.e. 10%) of transformation occurs through the reductive dechlorination process. The synergistic effects of stimulated anaerobic biodegradation and abiotic processes would further reduce cis-1,2-DCE and VC to less toxic by-products.

Considering the aquifer properties and the substrate blend to be used, AMEC estimates the longevity of the product at approximately 12 months.

A breakdown of the objectives for installing the Product ABC+ reaction zone are detailed below:

- Calculate horizontal and vertical propagation of fluids to be injected based on the results of the pilot study.
- Design and setup of chemical mixing and staging areas to facilitate injections
- Continuation of injection activities after 12 months, if deemed necessary
- Perform rebound monitoring to verify that additional injections are not required.
- Cease rebound monitoring and begin stability monitoring when plume concentrations at perimeter of compliance wells (POC) have reached stable or decreasing concentrations.
- Cease stability monitoring when plume concentrations at POC and sentinel wells have reached a stable or decreasing concentrations through use of stability monitoring and quantitative and temporal analyses of the data.

- Submittal of Record of Closure form to IDEM to cease remediation activities.

7.2.1 Scope of Work

The following activities will be completed as part of the Product ABC+ reaction zone remediation implementation:

- Prepare Health and Safety Plan
- Obtain UIC permits or permit exemptions for direct-push injections
- Survey injection locations
- Set up product staging areas, product handling and mixing procedures
- Implement injections at the designated areas
- Repeat injections as needed every 12 months
- Complete performance monitoring of groundwater parameters
- Performance evaluation (reporting)

7.2.2 Contractor Information

AMEC is in the process of soliciting bids from drilling contractors to install the injection wells. Following evaluation of the bids and contractor selection, AMEC will select a drilling contractor based on price, site experience, technical capabilities, and availability.

AMEC plans to contract Territorial Engineering LLC (Territorial) in Walkerton, Indiana to survey horizontal and vertical control coordinates of the direct-push injection points. Territorial has performed survey work at the Site since 2009.

AMEC plans to contract Redox Tech, the manufacturer of product ABC+ to conduct the injections of the ABC+ blend under the oversight of an AMEC field team leader.

7.2.3 Schedule

Injection activities are scheduled to begin approximately 130 days following work plan approval. A proposed schedule detailing the specific activities is present in Appendix L.

7.3 Down-Gradient Groundwater Remediation Objectives

The objective for the down-gradient remediation is to achieve stable or declining plume concentrations A breakdown of the activities to attain this objectives are detailed below:

- Analyses of vertical and horizontal extent of VOCs to be targeted for treatment and incorporate into this RWP.
- Calculate horizontal and vertical propagation of fluids to be injected based on the results of the pilot study.
- Installation of injection wells at desired locations based on the results of pilot testing. Installation of additional injection wells if deemed necessary based on soil lithology findings during initial injection well installation.
- Design and setup of chemical mixing and staging areas to facilitate multiple injections.
- Analyses of injection fluids and volumes to be used for the first set of injections for the full-scale implementation. Sustain or modify subsequent injection blends based on performance monitoring results.
- Continuation of injection activities as detailed in the subsequent sections of the RWP until favorable redox conditions are present and VOCs have decreased and appear to be on the pathway of complete reductive dechlorination.
- Perform performance groundwater monitoring to verify that additional injections are not required.
- Cease performance monitoring and begin stability monitoring when plume concentrations at POC wells have reached stable or decreasing concentrations.
- Cease stability monitoring when plume concentrations at POC and sentinel wells have reached a stable or decreasing concentrations through use of stability monitoring and quantitative and temporal analyses of the data.
- Submit the Record of Closure form to IDEM to cease the remediation activities.

7.3.1 Scope of Work

The following activities will be completed as part of full-scale source area groundwater remediation implementation:

- Prepare Health and Safety Plan

- Obtain UIC permit exemptions
- Install injection wells and soil lithology profiling
- Survey injection well locations
- Set up product staging areas, product handling and mixing procedures
- Implement injections at the designated areas
- Repeat injections as needed every 90 to 180 days
- Complete performance monitoring of groundwater parameters
- Performance evaluation (reporting)

7.3.2 Contractor Information

Contractor information is provided in Section 7.1.2.

7.3.3 Schedule

Well installation activities will begin following the installation of the source area injection wells referenced in Section 7.1. AMEC anticipates that the drilling and well installation activities for the down-gradient areas will require approximately 84 calendar days to complete. Approximately 20 to 30 days following well completions, AMEC will commence with injections. A proposed schedule detailing the specific activities is present in Appendix L.

7.4 Sub-Slab Vapor Depressurization Objectives

Design and Install a SSDS that will provide a negative pressure beneath the Plant slab and maintain Site COCs in indoor air at concentrations less than the screening levels for industrial/commercial use in the area of source area injections.

7.4.1 Scope of Work

The following activities will be completed as part of the SSDS installation:

- Prepare Health and Safety Plan
- Prepare design specifications for the installation of ancillary piping and the blower system
- Install vapor extraction sumps
- Provide contractor oversight during the installation of the ancillary piping, connection to the extraction sumps, and installation of the roof-mounted blower system

- Perform system start-up and balance system
- Monitor vapor and vacuum at probe locations
- Install telemetry system and monitor operation periodically via computer

7.4.2 Contractor Information

AMEC will self implement the extraction sump installation under the direction of Mr. Paul Stork. AMEC is in the process of soliciting bids from mechanical contractors to install the SSDS system. Following evaluation of the bids and contractor selection, AMEC will select a contractor based on price, site experience, technical capabilities, and availability.

7.4.3 Schedule

Installation of the SSDS will begin approximately 12 weeks after IDEM approval of this RWP. AMEC anticipates approximately 30 days will be required to complete the SSDS installation. A proposed schedule detailing the SSDS installation and start-up activities is present in Appendix L.

8.0 REMEDIAL DESIGN APPROACH

8.1 Overview of the Remedial Design

The preferred alternative from the FS, involved treatment of the source zone by biostimulation coupled with an injected ZVI barrier at the downgradient edge of the source zone. Treatment of the downgradient plume was proposed to be accomplished in a similar manner.

The overall remedial approach involves treatment of a portion of the source area using in-situ chemical reduction (ISCR) technology. The remainder of the source area outside of the building and beneath the manufacturing plant would be addressed by stimulating biologically mediated reductive dechlorination, referred to as enhanced reductive dechlorination (ERD) or biostimulation. The downgradient treatment zone (downgradient plume) to the vicinity of MW-26 and MW-17 would be also be addressed by ERD. In the vicinity of MW-26 and MW-17, a biobarrier will be installed based on the use of a very long lived reductive dechlorination amendment. Figure 8-1 provides a plan view or layout of the remedial design.

ZVI is a strong reducing agent that has been demonstrated in permeable reactive bed (PRB) applications to be an effective form of treatment of chlorinated volatile organic compounds (CVOCs). ISCR is an extension of this technology and involves injection of fluidized ZVI using a variety of carrier fluids. In-situ chemical reduction involves the synergistic effects of stimulated anaerobic biodegradation by addition of an organic carbon source and direct chemical reduction with reduced metals. The combination of controlled release of organic carbon to stimulate anaerobic biodegradation and direct reduction via ZVI or another reduced metal will drive aquifer geochemistry to a very reductive environment. Mineralization of the CVOCs occurs by a combination of reductive hydrogenolysis and dichloroelimination (also known as β elimination). The primary pathway followed in ISCR is β elimination. The general reaction and reaction specific to trichloroethylene are shown below as equations (1) and (2):

(1) $RXn + 2H+ + 2e- \rightarrow RHXn-2 + 2HX$

(2) $CHCl=CCl2 + 2H+ + 2e- \rightarrow CH=CCl + 2HCl$

Although the primary pathway is via beta elimination, some dechlorination by the hydrogenolysis pathway does occur because of the inclusion of the organic carbon source in the carrier.

Most of the plume in the treatment zone will be addressed by injection of an electron donor to stimulate anaerobic biological degradation of the CVOCs. Bioremediation involves the use of biologically mediated reactions to break down contaminants. Microorganisms generally derive energy from redox reactions. An enzyme-mediated redox reaction is the transfer of electrons from electron donors to acceptors. Energy is derived from these reactions when the energy source (electron donor) is oxidized, transferring electrons to an acceptor and releasing energy conserved in the chemical bond. Once the electron donor has been completely oxidized, the compound is no longer a source of energy.

Mechanisms used by microorganisms to produce energy are generally either aerobic processes or anaerobic processes. In an aerobic process, oxygen serves as the electron acceptor and is reduced to water. The electron donor is natural or anthropogenic carbon. Anaerobic processes rely on nitrate, iron, sulfate, or carbonate in the absence of oxygen to complete organic compound oxidation. Microbial transformations of chlorinated solvents under anaerobic conditions are reductive reactions that involve either hydrogenolysis or dihaloelimination. The most important process for natural biodegradation of the more highly chlorinated species is hydrogenolysis or reductive dechlorination.

Highly chlorinated compounds (such as PCE and TCE) are more susceptible to reductive dechlorination. Vinyl chloride, which has a relatively low oxidation state, is more readily degraded as a primary substrate by aerobic processes than by reductive dechlorination. However, addition of sufficient biodegradable organic substrates can drive the aquifer conditions to a sufficiently reductive state to reduce vinyl chloride to ethene.

Many organic substrates, such as acetate, butyric acid, lactic acid, methanol, ethanol, vitamin B12, sucrose, Hydrogen Release Compound (HRC), advanced HRC, and vegetable oil emulsions have shown to be effective in acting as the primary substrate to enhance the anaerobic transformations. The primary factors that influence selection of substrates are site hydraulics, presence of dense, non-aqueous phase liquid, and aquifer geochemistry.

The overall remedial design approach is very similar to the preferred alternative identified in the Feasibility Study. However, the remedial design approach involves the following three modifications from the preferred alternative in the FS:

- In–situ chemical reduction is applied at the head of the plume rather than east of the manufacturing plant
- The injected ABC+ (ZVI) wall east of the manufacturing plant has been removed from the design approach

- The injected ABC+ (ZVI) wall in the vicinity of monitoring well MW-26 and MW-17 has been replaced by an injected biobarrier

The decision to apply the injected ABC+ (ZVI) wall at the head of the plume was based on localized groundwater velocities and the potential for some residual DNAPL.

Groundwater velocities calculated for the area west of the service road from INJ-1 to down gradient point PM-1 ranged from 5.06 to 6.15 ft/day. Seepage velocity from INJ-1 to PM-2 was also very elevated ranging from 3.08 to 3.79 ft/day. The area east of the access road had significantly lower groundwater velocities. Groundwater velocity from INJ-2 to PM-3 ranged from 1.03 to 1.4 ft/day.

Very elevated groundwater velocities exist for the area west of the access road in the immediate vicinity of the pond due to a localized hydraulic push exerted by the surface water body (Western Pond). At these high groundwater velocities , a significant fraction of any relatively soluble amendment comprised of a mixture of lower and mid range fatty acids would be transported from the area within 30 days of injection. These estimates correlate with observations from the pilot test in which elevated TOC was observed at MW-59 and MW-81 approximately 30 days after injection but subsequently dissipated rapidly. Under these circumstances, injection of ZVI is preferred since that amendment will remain in the vicinity of the injection zone for a prolonged period of time.

As noted in Section 6, the highest observed concentrations of TCE were found in the vicinity of the pond at MW-81(27) (13 mg/L) and INJ-1 (35 mg/L). Very elevated concentrations of cis-1,2-DCE were also observed INJ-1 (400 mg/L). The baseline concentrations of TCE and cis-1,2-DCE at INJ-1 are suggestive of some mass of residual DNAPL in this area. The potential presence of some residual DNAPL in this part of the source area indicates the need for a more aggressive treatment approach than envisioned in the FS. As discussed, ISCR achieves dechlorination via dual pathways and therefore depresses redox potential more significantly and for a longer timeframe than ERD. Therefore, the design for this portion of the source area was modified to include this more aggressive strategy.

Although groundwater velocity is very rapid in the immediate vicinity of the Western Pond, it declines significantly in the area beneath the manufacturing plant. Seepage velocities from PM-3 to MW-67 and MW-72 were estimated at 0.12 to 0.14 ft/day. Slightly greater seepage velocities (0.2 to 0.36 ft/day) were estimated for well pairs MW-67 to MW-78, MW-67 to MW-20, MW-72 to MW-20, and MW-68 to MW-20. Groundwater flow rates are lower in the upper portion of treatment Zone A (0.06-0.16 ft/day) than beneath the building. As noted in

Section 6.4, elevated concentrations of ethene were observed at MW-59 within 90 days of the pilot injection. An increase in ethene was also noted at MW-81 (27) where the increase in TOC was much less significant. Where significant ethene was not observed in the pilot injection, TOC levels indicated that the substrate had been deflected from that monitoring point due to silt lenses or swept from the monitoring well as a result of elevated groundwater velocity. Additionally, DHC populations at the monitoring wells increased by several orders of magnitude following injection and were within the appropriate range in the March 2013 sampling event for complete dechlorination to occur. The data from the pilot indicate that where adequate electron donor is distributed and can be retained in the treatment zone for a sufficient time that dechlorination will proceed to completion. Based on these considerations, the injectable ABC+(ZVI) wall on the east side of the manufacturing plant was determined to be unnecessary and was eliminated from this design.

Groundwater velocities are also elevated in Treatment Zone D. The preferred alternative in the FS included an injectable ZVI wall at the end of Treatment Zone D. This design has retained a similar conformation but has replaced the ABC+ (ZVI) with a liquid amendment that is a mixture of ethyl lactate, glycol, mid-range fatty acids and oleic acid. The oleic acid fraction in the selected amendment will be about 40%. Oleic acid is the primary hydrolysis product formed in the initial step of breakdown of emulsified oil substrates and therefore the selected amendment avoids the initial hydrolysis reaction from the triglyceride to yield a very immobile (or strongly adsorbed) and long lived substrate. The selected amendment is emplaced via permanently installed injection wells and can be more easily and readily replenished than ZVI if that is indicated as necessary by post–injection monitoring. Additionally, injection of ABC+(ZVI) will be retained as a contingency approach if post injection monitoring indicates that the oleic acid based biobarrier is subject to relatively rapid degradation due to the high transport velocities in that portion of the plume.

8.2 Source Area - In Situ Chemical Reduction

The preferred Alternative from the FS involved treatment of the source zone by biostimulation coupled with an injected ZVI wall at its downgradient edge (east side of the manufacturing plant). The downgradient treatment zone was to be treated in an analogous manner. Data developed from the Pilot Study indicated that application of ISCR in the source area to the west of the manufacturing plant would be preferable over the concept design in the FS. The decision to apply the injected ABC+(ZVI) wall at the head of the plume was based on localized groundwater velocities and the potential for some residual DNAPL. This Section provides the rationale for this modification to the concept design. Additionally, this Section provides the design basis for the injection points, amendment loading and the amendment injection process.

8.2.1 ABC+(ZVI) Injection Point Spatial Array

The injection point layout for the source area west of the manufacturing plant is provided in Figure 8-2. A total of 30 ABC+ injection locations will be installed in an area 40 ft. wide by 65 ft. long between the western pond and the service road in the source area treatment zone. These 30 injection points will be installed in four rows with each row containing seven or eight injection locations. Except for the injection locations installed directly before distribution monitoring and the locations used for distribution monitoring, two borings will be installed at each injection location.

Due to the steep bank of the Western Pond, a gravel base consisting of large rock and cobbles will be required to be installed to support the drill rig prior to the injection of the ZVI. Figure 8-2 shows the approximate extent of the rock base that will be used to fill in the approximately 10 feet of the Western Pond shore near ZVI Row 1.

The injection spacing for application of ISCR in this source area is eight feet between points in the north to south direction. Injection locations are also spaced eight feet apart from west to east. This provides an approximate spacing between points of 10 ft along the direction of groundwater flow. This spacing was based on the apparent distance of ZVI propagation from the pilot test in combination with the overall results observed in the pilot.

Pilot ISCR injections were conducted October 29-31, 2012. Soil sampling and visual observations indicated ZVI propagation to a distance of about 15 ft with some indication of propagation to about 20 ft from the edge of the injection array. During the initial sampling event following injection, total iron in the upper interval of ZVI-1 was detected at 23 mg/L but ferrous iron was detected at 6.0 mg/L. A similar difference between total and ferrous iron was observed at the deeper interval of ZVI -1. Over the duration of the monitoring program, the difference between soluble iron and total iron at ZVI-1 declined. These data suggest that ZVI was propagated from the injection array to the approximate distance of ZVI-1. ZVI-1 was located 12 ft directly perpendicular from the initial injection row and approximately 15 ft from the injection row in the direction of groundwater flow. For the pilot study, the injection points were spaced approximately 15 ft apart perpendicular to flow.

The pilot study injections demonstrated a significant and sustained reduction in redox potential that indicated the establishment of iron to sulfate reducing conditions. However, inconsistent results were obtained from the various monitoring locations with respect to reduction of the chlorinated VOCs. The variability in reduction of the chlorinated VOCs at various locations is likely due to some matrix desorption and rapid advective transport of the more soluble fractions of the ABC that was co-injected with the ZVI.

Based on the results from the pilot study, the injection points will be more tightly spaced for treatment of the source area near the pond. The increased density of injection points (and corresponding increased areal loading of ZVI) will provide greater overlap of amendment injected along an upgradient row with the subsequent downgradient row. As such, this increased density should yield a greater reduction in redox potential than observed in the pilot study. As subsequently described in Section 8.2.3, the ABC formulation to be co-injected with the ZVI has been modified to reduce the potential for rapid advective transport of the more soluble fractions.

The injection locations extend to the north of the anticipated source area treatment zone to treat the area slightly upgradient of MW-81(27), where significant levels of TCE have been detected.

Figure 8-3 provides a cross section of the ZVI injection zone. Injections will be conducted on three foot intervals from approximately 755 ft to 776 ft NAVD 88 on Rows 1 and 2. The bottom of the treatment zone will be variable and shall extend to the clay layer that is encountered between 753 ft and 758 ft NAVD 88 (See Figure 3.2). The bottom of the initial injection interval will terminate at this clay layer. Injections will be performed in silt lenses that are directly above this clay layer or interbedded with the overlying sands.

The injection interval for Rows 3 and 4 will extend from approximately 755 ft to 779 ft NAVD 88. This upper three foot interval was not included for Rows 1 and 2 to reduce the potential for amendment to surface in the pond.

8.2.2 Amendment Dosage

The processes, injection methods, and loading rates used for ISCR in this RWP are based on the product ABC+ which is a proprietary formulation registered to REDOX TECH. Any variation from the chemistry used as the basis for this design will alter the prescribed loading, injection sequencing and costs.

The design loading for this application is 35,880 lbs of microscale ZVI blended with approximately 1,260 gal of a modified form of ABC known as ABC-ole. ABC-ole is a modification of standard ABC that contains a high mass fraction (~40%) of oleic acid. Oleic acid is the initial product formed from the hydrolyses of emulsified vegetable oil substrates. The oleic acid fraction is relatively immobile in advective groundwater flow. Similar to emulsified oil substrates, the oleic acid fraction provides approximately an order of magnitude greater mols of electron donor relative to more water soluble substrates. Therefore, following the initial release of the more soluble fractions from the ABC-ole which provides an initial stimulus for ERD, this substrate will provide a very sustained release of electron donor as the oleic acid and its daughters are slowly hydrolyzed.

The ABC and microscale ZVI will be blended with water for injection as either a 15% or 20% by weight slurry. The blend will be determined from observations and electrical conductivity (EC) logging of the initial injection at 20% slurry. Injection as a 20% slurry is preferred and will be used unless EC logging indicates the need for a reduced viscosity slurry.

For application as a 20% slurry, the microscale ZVI and ABC+ will be blended with 15,775 gal of water. Each injection point will receive ~635 gal of slurry. For rows 1 and 2, each interval will receive approximately 91 gal of ABC+ yielding a loading of ZVI of 170 lbs per interval. For Rows 3 and 4, each interval will receive approximately 80 gal of ABC+ yielding a ZVI loading of 150 lbs.

For application as a 15% slurry, microscale ZVI and ABC, will be blended with 22,800 gal of water. Each injection point will receive ~872 gal of slurry. For rows 1 and 2, each interval will receive approximately 125 gal of ABC+ yielding a loading of ZVI of 170 lbs per interval. For Rows 3 and 4, each interval will receive approximately 109 gal of ABC+.

Based on the relatively high loading used in this design and the modification to use oleic acid modified ABC which will exhibit limited mobility from the injection zone, a polishing injection is not anticipated. The need to supplement this injected ABC+ (ZVI) wall will be determined from a minimum of two years of post injection monitoring.

8.2.3 ABC+ Injection Parameters and Sequencing

Injection methods for applying ISCR amendments are dependent upon the subsurface characteristics. The most commonly employed methods are:

- Pneumatic fracturing using a high volume , moderate pressure air stream to create a fracture network followed by injection of the amendment
- Hydrofracturing injection through direct push technology (DPT) or Geoprobe rods
- Moderate pressure application through Geoprobe rods

Direct injection at moderate pressures can usually be employed in formations with conductivities of 10-4 cm/s or greater. This approach was successful in the

ZVI Pilot Study and will be employed for this application. Propagation can be relatively flat lying, gently dipping, or steeply dipping. In over consolidated deposits, such as glacial sediments, propagation tends to be flat lying or gently dipping. During the ZVI Pilot Study, surfacing was only noted during injection on one point indicating that propagation tended to be flat lying or gently dipping.

For this application, the amendment will be introduced through Geoprobe rods fitted with an expendable tip at pressures of 100-200 psi and 3-4 gpm. These conditions will simply expand pore spaces within the matrix to allow radial movement of the ZVI from the injection point to a distance of 10-15 ft.

The injections will be conducted in a “bottom up” conformation using an expendable tip on the Geoprobe rods that is ejected at the bottom of the borehole. At each injection point, the injection will propagate through a 3 ft thick vertical interval for a horizontal distance 10-15 ft. In order to initiate the injection sequence, the rods will be pushed to the bottom elevation of the interval and subsequently pulled up or withdrawn to its midpoint. The specified quantity of amendment for that interval will be injected at 100-200 psi and 3-4 gpm. After completing injection in that interval the rods will be withdrawn approximately 3 ft and the process repeated. For Rows 1 and 2, the bottom four intervals (755-758 ft NAVD 88, 758-761 ft NAVD 88, 761-764 ft NAVD 88, and 764-767 ft NAVD 88) will be injected using one borehole. The upper three intervals in the injection locations in Rows 1 and 2 will be injected using a second borehole. During injection through the second borehole the rods will remain in place in the first borehole to prevent surfacing of the amendment. For Rows 3 and 4 this process will also be followed with injection in the first four intervals from one borehole and injection in the upper four intervals through a second borehole. Alternately, for Rows 3 and 4, injection may be conducted using three boreholes to improve amendment distribution. Upon completion of injection at a given location, the rods will be extracted and the borehole will be filled with a 95/5 ratio neat cement grout. The neat cement grout will consist of a mixture of ninety-four (94) pounds of cement and no more than six (6) gallons of clean water. Bentonite will not exceed 5% of the total mixture.

The ZVI injection will begin with amendment being injected into locations 9, 14 and 18. As indicated above, two boreholes will be used at these locations with the first borehole for injection of the four lowest intervals and the second borehole for injection of the upper three intervals. The following day after injection at locations 9, 14, and 18, three downgradient points (16, 21 and 25) will be logged with the EC probe on the Geoprobe to verify the extent of propagation. The presence of iron will significantly increase the electrical conductance of the formation and can be identified using EC logging. After logging is complete, ZVI injection will occur at these three points in a single bottoms up manner (injection from 755 ft to either 776 ft or 779 ft NAVD 88) using the logging borehole. The sequence for the ZVI injections in the source area is provided below.

ABC+(ZVI) Injection Sequence

Estimated Order	Injection Points	ABC+ Injection	EC logging
1	9/14/18	X	
2	16/21/25		X
3	16/21/25	X	
4	30/12/3	X	
5	10/19/23		X
6	10/19/23	X	
7	1/15/28	X	
8	5/11/17	X	
9	26/7/20	X	
10	2/8/24	X	
11	4/13/29	X	
12	6/22/27	X	

8.2.4 ABC+(ZVI) Injection Process

The material handling process involves two 1,000 gal blend tanks for mixing ABC-ole stock with water. Approximately 1,260 gal (5 totes) of ABC-ole will be used for this operation. The ABC will be metered to the blend tank for dilution with the appropriate volume of water and blended by recirculation using air driven diaphragm pumps. The diluted ABC solution will subsequently be transferred to the mixing hopper of a grout plant that has rotating vanes. The microscale ZVI and guar gum (as needed) is conveyed to the mixing hopper and added to the mixture. This mixture becomes a thixotropic slurry that reduces in viscosity with constant shear over time. Therefore, blending of the ABC+ mixture for a pre-set time is needed before the mixture can be injected using an air driven piston pump that is integral with the grout plant.

The process is air driven and requires mobilization of an air compressor. Approximately 300 square feet of space is needed for the process equipment. Additional storage space of 200 square feet is needed for storage of the ABC stock and microscale ZVI. The only utility required for the operation is a potable water supply which will be obtained from an auxiliary process water line at the plant that provides 40-50 gpm. Approximately 22,800 gal of water will be required for blending the ISCR amendment for the source zone. The source Zone ABC+ injections are estimated to require approximately 20 days

8.2.5 ABC+ Monitoring Methods

Prior to ABC+(ZVI) injections in the source area, wells MW-80, MW-81(45), PM-1, and INJ-1 must be plugged and abandoned to prevent surfacing of the ZVI slurry through a preferential pathway that me provided by these wells. Injection well INJ-3 will also be close since it is is not planned for use in the source area ERD injections (Section 8.3) The wells to be closed must be filled with a 95/5 ratio neat cement grout. The neat cement grout will consist of a mixture of ninety-four (94) pounds of cement and no more than six (6) gallons of clean water. Bentonite will not exceed 5% of the total mixture.

During the ZVI pilot study, soil and groundwater samples indicated propagation beyond ZVI-1 (12 ft from the edge of the injection array) to at least 15 ft. Some ZVI seams were observed at ZVI-2 at 22 ft from the edge of the injection array. MW-81(27), INJ-2, INJ-3, and MW-59, and PM-2 are located 18-20 ft from the edge of the injection array and these wells may not be impacted significantly from the ZVI injections. With the exception of INJ-3, which will not be used in the Source Area ERD injections (Section 8.3), these wells are in locations where they would have to be replaced if abandoned. Therefore, to reduce drilling costs MW-81(27), INJ-2, MW-59, and PM-2 will be retained unless the initial EC logging and observations at the wells during the ZVI injections indicate propagation and short circuiting into these wells.

Hydraulic profiling tool (HPT) logs are used to evaluate hydrostratigraphy and correlate well with formation permeability. The HPT is also useful for the detection of high electrical conductivity fluids in soil. Detection of these fluids is commonly observed as an anomaly between the EC and HPT log. This occurs when the EC increases while the HPT indicates a zone of high permeability. This information will be used to guide the DPT installation of ABC+ injection points to optimize amendment distribution with respect to amendment propagation and injection pressures.

Two background HPT logs will be conducted within the source area injection field east of the western pond following Geoprobe Standard Operating Procedure (Geoprobe, 2013). The location of these HPT logs is shown in Figure 8-2. The HPT probe is equipped with a small stainless steel screen that injects water into the formation as the probe is advanced into the subsurface. The probe is advanced at approximately 2 centimeters per second (cm/s) by pushing with the Geoprobe unit hydraulics and/or hammering with the percussion hammer when necessary. Water is injected into the unconsolidated formation at a flow rate of about 300 mL/min through a high-pressure hose in the trunkline. The trunkline is pre-strung through the probe rods before the HPT probe is advanced into the subsurface. The HPT probe also contains a Wenner EC array. A simple string-pot system is used to track the depth of the probe while it is advanced. A pressure transducer inside the HPT probe monitors the total pressure observed as water is injected into the formation. The flow rate and HPT pressure response, as well as the formation EC, are tracked with depth and plotted on the computer screen as the log is run. HPT logs reflect any reduction in permeability with an increase in pressure and often a decrease in flow rate. Increased pressure may be the result of an increase in clay content, silt content, density, or potentially cementing that reduces permeability. The EC log is generally most responsive to clay content, so that increases in electrical conductance usually correlate with increased clay content.

In order to distinguish between background soil conditions and the expected injection ROI, background soil logs will be collected. Without background EC data, it is impossible to determine whether variations in electrical conductivity are caused by variations in fluid chemistry, clay content, or a combination of both. Therefore, prior to the beginning of the ABC+ injection, two background EC logs will be collected at areas along the perimeter of the injection area to establish baseline electrical properties of the subsurface media to a depth of approximately 40 feet bgs. Simultaneously three stilling wells will be installed in the western pond, equipped with data loggers to monitor specific conductivity in the pond during injection indicating any incursion of ZVI into the surface water.

Monitoring wells to be used for post injection monitoring include MW-81(27), PM-2, and MW-59(29). Although it is desirable to re-install a replacement well at INJ-1 or PM-1, there is a strong probability that replacement monitoring wells in these locations will prove difficult to develop due to the ZVI in the formation. Section 11 describes the parameters and frequency for post injection monitoring.

8.3 Source Area Outside Building -Enhanced Reductive Dechlorination

The area east of the pond and access road behind the manufacturing plant within the source area shown in Figure 8-1 will be addressed by ERD. Biostimulation will be accomplished by injection of a modified form of product ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.3.1 Injection Well Spatial Array

The source area east of the service road to the facility's western wall has an areal extent of approximately 70 ft. wide by 120 ft. long. A total of 19 injection wells will be installed in two rows to address two separate depth intervals. Nine wells will be installed for injection in the upper interval with their screens extending slightly into the silt lense that occurs at approximately 772 to 775 ft NAVD 88. The screened intervals of these wells vary depending on the elevation of the silt layers in this area. The layout for this injection array with inferred areas of influence for the injection wells is shown in Figure 8-4. The inferred area of influence is an ellipse 20 ft. wide by 25 ft. down gradient which was based on data from the area of influence pilot test, local groundwater velocities, and estimated retardation of the amendment. Based on the seepage velocities from INJ-2 to PM-3, estimated amendment lifetime and retardation the hydrodynamic estimates of travel distance indicate that amendment injected on Array A will reach well into Array B.

Ten wells will be installed for injection in the lower interval from approximately 754 to 768 ft NAVD 88 as shown in Figure 8-5. The screened intervals of these wells vary depending on the elevation of the silt layers in this area.

Existing injection wells INJ-2 and INJ-3, installed during the pilot study, are located in Array A near the service road. INJ-2 will be utilized for the remedial injections to reduce drilling efforts. It is likely that the majority of the amendment introduced into INJ-2 will exit the portion of the screened interval in the sand due to the lower permeability and consolidation of the silt layer. INJ-3 will not be used for the remedial injections since its screened interval is above the targeted treatment interval. Injection well 3 will be installed adjacent to INJ-3 and will serve as its replacement.

Injection wells 5 to 9 and 15 to 19 in Array B will be installed as close to the crest of the hill as reasonably possible to provide distribution beneath the western edge of the building. Hydrodynamic estimates of travel distance indicate that amendment injected on Array B will reach to the edge of Array C within the building

The injection arrays extend the source area treatment zone slightly north of MW-81 to the north to treat the full extent of contamination. Groundwater samples from MW-81(27) have exhibited elevated concentrations of TCE and daughters while samples from MW-89 have not exhibited detections of these species. Therefore the horizontal extent of contamination to the north is located in between these two wells.

8.3.2 Injection Well Installation and Construction

The bottom of the screened interval for the Array A upper interval wells (wells 1-4) will extend slightly into the silt layer that occurs at approximately 770-776 ft NAVD 88 as shown in Figure 8-6 The bottom of the Array A lower interval well's (wells 10-14) screened interval will extend slightly into the silt or clay layer that occurs at approximately 753-763 ft NAVD 88 also shown in Figures 8-6. The screened intervals for the Array A wells will be generally installed in the more permeable sand layer. With the exception of INJ-2, which will be used for the remedial injections, the points are not screened into the silt lense for several reasons. First, the available data indicate that the lense is not generally sufficiently thick for installation of the screen, sand pack, and seal within this lithology. Due to likely consolidation of the silt lense any amendment injected at a point screened across both sand and the silt lense will likely deflect entirely within the sands. This phenomenon was observed during pilot testing where amendment injected at INJ-1 was deflected toward MW-59(29) by an immediately downgradient silt lense at PM-1 at the same elevation as the INJ-1 screened interval.

Second, INJ-1 which is not screened in a silt lense exhibited three to ten times greater concentrations of TCE and cis-1,2-DCE than MW-81 which is screened in a silt lense. These data suggest that the chlorinated VOCs are distributed within both layers rather than being preferentially adsorbed in the silt layers. Although it is recognized that a significant portion of contaminant mass may be adsorbed in the silt layers, the majority of the contaminant mass in the silt layer will be within a limited thickness at the sand/silt interface. Significant penetration into the silt layer would be impeded by that layers lesser permeable and would only occur in the case of DNAPL which was not observed in these borings.

Amendment injected slightly into the silt layer or at the sand/silt interface will create a diffusion gradient that will increase desorption of the chlorinated VOCs from the upper portion of these silt lenses. Therefore, the bottom of the screened intervals of the injection wells will be extended slightly into these layers.

The bottom of the screened interval for the Array B upper interval wells (wells 5-9) will also extend slightly into the silt layer that occurs at approximately 778 ft NAVD 88 as shown in Figure 8-7. The bottom of the Array B lower interval well's (wells 15-19) screened interval will be at approximately 755 ft NAVD 88 as shown in Figures 8.7. Lithologic data are not available to determine if a clay or silt layer is present at this approximate elevation at the Array B location. The bottom of the screened intervals for the Array B wells will be installed at this general elevation in the more permeable sand layer. If silt or clay lenses are encountered above this general elevation, the bottom of the screened interval should be set in contact with the less permeable layer.

In the source area located outside of the building, nine borings will have a nested well pair installed at the appropriate depths. Boring 13 will have a single injection well installed. Borings for injection well installation will be advanced using either sonic or HSA drilling methods. In the source area outside of the building, a nominal 8.25-inch OD X 4.25-inch ID borehole will be advanced from the ground surface to a given depth based on the pre-determined elevation for the well screen (Table 8-1). For rotosonic methods the borehole will be of equivalent diameter.

At this site heaving sands can be problematic. Therefore, if HSA is chosen, a bottom plug may be used in the bottom of the HSA string. It may be necessary to over-drill the borehole in anticipation of material entering the augers during removal of the bottom plug. Normally, 1 to 2 feet is sufficient for over-drilling. Clean water will be poured into the augers to equalize the pressure so that the inflow of formation materials and water will be held to a minimum when removing the bottom plug. The bottom plug (composed of either wood or PVC) should be knocked out of the bottom of the augers using 2-inch (AW) steel rods.

Before the well screen and casings are placed on the bottom of the borehole, at least 6 inches of filter material should be placed at the bottom of the borehole to serve as a firm footing. The string of well screen and casings should then be placed into the borehole and plumbed. The filter pack material will consist of a clean, rounded to well-rounded, quartz silica sand of 10/30 sieve size (i.e., between 1/10 and 1/30 inch in size). Field sieve analysis indicated a median grain size of approximately 0.024 inches.

The augers should be slowly extracted as the filter pack is tremied into place using a 1-inch PVC tremie pipe lowered between the screen/casing and the augers. The gradual extraction of the augers allows the materials being placed in the augers to flow out of the bottom of the augers into borehole. The filter pack will be extended a minimum of 1 foot and a maximum of 2-feet above the top of the well screen.

At each location, the lower interval injection wells will be located up-gradient of the upper interval injection well inside the borehole to minimize the adjacent wells' casing from altering the injectate distribution.

A bentonite seal of a minimum 1-foot vertical thickness but no more than 2-foot thickness, consisting of medium grade crushed (1/4 to 3/8-inch) bentonite, will be placed above the sand pack and hydrated with clean water. Following seal hydration (minimum 2 hours), the remaining annulus will be filled with a 95/5 ratio neat cement grout. The neat cement grout should consist of a mixture of ninety-four (94) pounds of cement and no more than six (6) gallons of clean water. Bentonite will not exceed 5% of the total mixture. The grout will be installed in a manner to prevent bridging of the annulus between the outside of the well casing and the borehole from the top of the bentonite seal to the ground surface.

Upper and lower level injection wells in the Source Area will be constructed from threaded and gasketed casing, with a 5-foot, threaded, 0.020-inch slot well screen, with 0.125 in slot spacing and threaded end cap. Each injection well will be completed flush with the ground surface and be housed in an 8-inch flush mount traffic rated manhole cover installed in a 2-foot square, 6-inch thick concrete pad. Injection wells will be developed by surging or similar means until the well produces clear water Figure 8-8 provides an injection well construction diagram.

The wells will be set through the augers or drill casing at each location in general accordance with Indiana Department of Environmental Management Drilling Procedures and Monitoring Well Construction Guidelines (Policy # WASTE-053-NPD) and Indiana Rule 312 IAC 13-8-3 Requirements for Monitoring Well Construction.

Drilling equipment (e.g., HSA, AW rods, tools) will be decontaminated between drilling each hole at a designated decontamination pad. Decontamination of equipment will consist of dislodging any loose dirt and subsequently using high pressure hot water or steam to wash the item.

The primary wastes that will be generated from implementation of the biostimulation in the source area behind the manufacturing plant will be soil cuttings, purge/development water, and clean-out wastewater from the substrate make-up process. Section 12 discusses the handling of the investigation derived waste (IDW).

8.3.3 Amendment Loading and Injection Parameters

As indicated, the highest concentrations of TCE (33 mg/L) and cis-1,2-DCE (400 mg/L) within the plume were found at INJ-1 which has a silt layer several feet beneath the bottom of its screen. Elevated concentrations of TCE (11 mg/L) and cis-1,2-DCE(46 mg/L) were also found at MW-81(27) which is partially screened within a silt interval. Concentrations of cis-1,2-DCE similar to those observed at MW-81(27) were found at several other source area borings including MW-59(29) (26 mg/L), PM-3 (37 mg/L), MW-68(32) (28 mg/L), MW-72(32) (97 mg/L). A vertical aquifer profile sample at MW-77 at approximately 30 ft bgs had the second highest level of cis-1,2-DCE (255 mg/L) found in the source zone. MW-

81, PM-3, and MW-72 are partially screened within silt layers whereas INJ-1, MW-59, MW-68 and the vertical profile sample at MW-77 were in the sand layer. These data suggest that TCE and its daughter products are distributed between both layers.

The injection wells are not screened in the silt layer because it is generally not sufficiently thick such that the screen and sand pack would be entirely within this layer. As previously stated, any amendment injected at a point screened across both sand and the silt lense will likely deflect significantly into the sands. The screened intervals have been set slightly into the silt layer to create a diffusion gradient in the upper portion of those layers to enhance desorption. Additionally, to address the portion of the CVOC mass that is within the silt layer, the ABC formulation will be modified to use a high ethyl lactate formulation.

Studies by Sorenson et al (2001) and others have shown that the addition of organic substrate to a residual DNAPL mass increases the rate of mass transfer from the organic phase to the aqueous phase. Increased dissolution and matrix desorption result from several factors including an increased concentration gradient between DNAPL or soils and the aqueous phase and biologically generated surfactants which reduce the interfacial tension between the DNAPL and aqueous phases. Sorenson determined that sodium lactate solutions decreased the interfacial tension between the DNAPL and aqueous phases by 26 to 47 percent. Addition of soybean oil has been shown to reduce the interfacial tension between the DNAPL and aqueous phases by 13 to 39 percent.

In addition to the mechanisms indicated above, ethyl lactate exerts a strong co-solvency effect on chlorinated ethenes. Ethyl lactate is non-toxic and miscible with water and many organic liquids. It has commonly been used as a food additive in cheese, beer, and grain products. Studies with ethyl lactate have indicated that a 50 percent solution with water can increase the solubility of PCE by a factor of greater than 200. At concentrations of 10 and 20 percent ethyl lactate in water, the solubility of PCE is increased by a factor of approximately three and eight times, respectively. The increased solubility of CVOCs in ethyl lactate/water solutions is a true cosolvency effect that is separate from enhanced dissolution due to the mechanisms of an increased concentration gradient or formation of biological surfactants.

Therefore, for the injections in the source area to the west of the manufacturing plant, the ethyl lactate in ABC will be increased by 50-100% above its fraction in the standard ABC mixture. The use of this high ethyl lactate blend will increase desorption and diffusion of the chlorinated VOCs from the silt lenses.

For each injection event, a total of 1,540 gal of high ethyl lactate ABC will be diluted into 12,340 gal of water for injection into the 20 wells. Each injection well will receive approximately 695 gal of amendment. Injection will be conducted at anticipated rates of 1.5 gpm-2.0 gpm and pressures at the discharge side of the control board of 5-10 psig. Injections will be simultaneously conducted on a row or array of five wells. Including time for set up and take down between arrays, the injections for this portion of the source area are anticipated to require approximately 45 hours.

Three injections are planned for the first year of the program. The need for additional injection in this area will be determined from monitoring of wells in this area over this time.

8.3.4 Amendment Mixing and Delivery System

Prior to material delivery AMEC will cordoned off an area between the access road and pathway to the facility for material and equipment storage. Orange barricade fencing will be used to cordon off the material and equipment staging area. Figure 8-9 presents the staging area location. Delivery of materials to the Site will be coordinated through AMEC. The substrate concentrate of ABC will be delivered in 270 gallon HPDE totes. AMEC will subcontract a delivery service company for delivery and initial staging of the totes.

If injection operations are conducted during cold weather (temperatures of less than 35 F) substrate will be stored within a heated building or enclosure before use. Under these circumstances no more than three totes will be maintained at the staging and mixing operation at a time. Additionally, the product amendment will be kept warm by placing it within a tent or similar enclosure and maintaining above freezing temperatures with a propane or electrically operated forced air heater.

AMEC will perform material management and mixing at the site. Material mixing and storage will be implemented using AMEC equipment and mixing containers. The material mixing process will consist of two 1,700-gallon, high density polyethylene (HDPE) tanks, transfer/mixing pumps, injection pump, flow and pressure instrumentation and control valves. Figure 8-10 presents the process equipment and the process flow diagram for material mixing.

Substrate concentrate will be transferred to the make-up process by a 110 V, 0.75 HP electrically-powered tote pump equipped with a flow totalizing meter and ancillary piping and controls. A tee will be fitted into the amendment transfer line to allow for rinsing out the system. Water for amendment mixing will be supplied from an ancillary plant process water line. Piping from the plant process water line will be fitted with flow totalizers, control valves, and check valves. Mixing of the substrate concentrate and water to generate the injectate will be performed by an electrically-powered 0.75 HP, 220 V, single phase centrifugal pump capable of 30 feet of discharge head at 30 gpm. Pump operation will be controlled by manual switches located next to each pump. Electrical power for pump operation will be provided by a portable generator.

After adequate mixing, valves in the blending line of the lead tank will be closed and valves for the lag tank will be opened to start the blending operation in the second tank. After switching the mixing operation to the second make-up tank, valves in the inlet line of the injection pump will be opened to begin the injection operation. In order to begin injection, valves in the inlet and discharge lines of the injection pump will be opened to begin the injection operation. The injection pump will be an electrically-powered 0.75 HP, 220 V, single phase centrifugal pump rated for 7-15 gpm of flow at 60 to 70 feet total discharge head. The injection pump will be controlled by local manual switch. Connection from the tanks to the injection pump will be made by a combination of 1.0 in Schedule 40 PVC pipe and 1.0 in PVC hose.

The discharge from the pump will be connected to a distribution manifold that has flow totalizing instrumentation at its inlet. The distribution manifold provides for simultaneous injection into eight (8) wells and has flow control valves and flow and pressure instrumentation for each of the individual branches. Sections of 1.0 in braided PVC hose with a rating of 150 psi will be used as the header for conveyance of the injectate to the injection well heads.

Up to eight (8) wells will be injected into simultaneously in each treatment area. In the source area outside the facility, two separate control boards will be required to complete the injection into the 19 wells.

Delivery hoses rated for 150 psi applications will be equipped with cam lock fittings and connected to each well head assembly. Each well head assembly will be constructed from Schedule 40 PVC pipe and fittings (or equivalent). Flow rates and pressures to each injection well will be monitored throughout the injection process.

8.3.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-81(27), PM-2, MW-59 (29) and PM-3. The frequency of monitoring and parameters are described in Section 11.

8.4 Source Area Under Building – Enhanced Reductive Dechlorination

The portion of the source area beneath the manufacturing plant (Figure 8-1) will be addressed by ERD. Biostimulation will be accomplished by injection of a modified form ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.4.1 Injection Well Spatial Array

The source area within or beneath facility has an areal extent of approximately 100 to 130 ft. wide by 130 ft. long. A total of 45 injection wells will be installed in six rows in the source area inside the facility in an area that is bounded to the west by the interior wall separating the main facility from the quality analysis lab, to the east by an interior wall separating the manufacturing area from office space, and to the north and south by treatment area lines delineated in Figure 8-11. These 45 wells will be installed with screened intervals of approximately 777 to 782 ft NAVD 88. The screened intervals of these wells will vary slightly depending on the elevation of the silt layer in this area. The layout for this injection array with inferred areas of influence for the injection wells is shown in Figure 8-11. The inferred area of influence was based on data from the area of influence pilot test, local groundwater velocities, and estimated retardation of the amendment.

Seepage velocities from PM-3 to MW-67 and MW-72 were estimated at 0.12 to 0.14 ft/day. Based on the distribution of amendment during injection, these seepage velocities and retardation of the amendment by the aquifer matrix, the area of influence for wells 1-17, located west of the main forklift aisle, is an ellipse that projects approximately 15 ft downgradient. Although not shown in Figure 8-11, amendment injected at within a given array is expected to eventually overlap with the next downgradient array (i.e., amendment injected in Array C will travel into the area of influence shown for Array D). Slightly greater seepage velocities (0.2 to 0.30 ft/day) were estimated for well pairs MW-67 to MW-20, MW-72 to MW-20, and MW-68 to MW-20. Therefore, for Arrays F-H (injection wells 24-45), located east of the forklift aisle, the area of influence extends slightly further down gradient (20 ft). Amendment injected within one of these arrays will travel into the area of influence of the next downgradient array.

Injection well locations were largely determined by the ability to access a location with a drill rig due to existing facility equipment and infrastructure. In general, injection well locations were determined first by where they were accessible by a drill rig, and then were placed accordingly by their area of influence to adequately distribute amendment across the treatment area. Field adjustments of well locations may be required due to areas inaccessible by drilling equipment.

8.4.2 Injection Well Installation and Construction

Injection wells in Arrays C-H within the building (wells 1-45) will have a five (5) ft. screened interval at approximately 778-783 ft NAVD 88 as shown in Figure 8-12 and Figure 8-13. The majority of contamination underneath the building is above the silt layer that occurs at approximately 778 to 779 NAVD 88. In order to target this interval the bottom of the boring for these wells should extend slightly into the silt layer. Before the well screen and casings are placed on the bottom of the borehole, at least 6 inches of filter material should be placed at the bottom of the borehole to serve as a firm footing. Where this silt layer does not exist, the bottom of the boring will be at 778 ft NAVD 88.

In the source area located beneath the building, 45 borings will be advanced using a Geoprobe® or similar drill rig and HSA drilling methods. A 14 in. diameter concrete core hole will be made in the concrete floor to allow sufficient room for the auger flights. Each borehole will have a single injection well installed. The wells will consist of 1 inch-diameter, Type II, Schedule 40 PVC casing with a 5-foot, threaded, 0.020-inch slot well screen and threaded end cap. The filter pack material will consist of a clean, rounded to well-rounded, quartz silica sand of 10/30 sieve size (i.e., between 1/10 and 1/30 inch in size). The filter pack will be extended a minimum of 1 foot and a maximum of 2-feet above the top of the well screen.

Unless otherwise noted in this section, injection well materials and installation will be installed in the same manner as described in section 8.3.2 of this work plan. Figure 8-8 previously provided details concerning the construction of these wells. A bentonite seal of a minimum 1-foot vertical thickness but no more than 2-foot thickness, consisting of medium grade crushed (1/4 to 3/8-inch) bentonite, will be placed above the sand pack and hydrated with clean water. The grout will be installed in a manner to prevent bridging of the annulus between the outside of the well casing and the borehole from the top of the bentonite seal to within 2 feet of concrete floor. The grout will be allowed to cure for a minimum of 24 hours before the concrete pad and flush mount protective cover are installed. For borings installed near operating machinery or other critical areas, the open hole will be covered with a steel plate during curing of the grout. The top 2-feet of the well annulus will be filled with a concrete slurry consisting of quick setting high strength (minimum 5,000 psi) Portland cement, with the flush mount well protector installed in the concrete extending approximately 1.5 feet below the surface. Injection wells will be developed by surging or similar means until the well produces clear water. Table 8-1 summarizes injection well construction details.

Cuttings and other wastes from well installation will be transported from the facility during each drilling shift. This may be facilitated by dropping a skid steer bucket in the work area for collection of wastes and making transfers to a roll-off located outside the facility during or at the end of each drilling shift. IDW management is discussed in Section 12.

8.4.3 Amendment Loading and Injection Parameters

Concentrations of cis-1,2-DCE similar to those observed at MW-81(27) were found at several source area borings beneath the building including MW-67(30) (21 mg/L), MW-68(32) (28 mg/L), MW-72(32) (97 mg/L). A vertical aquifer profile sample at MW-77 at approximately 30 ft bgs had the second highest level of cis-1,2-DCE (255 mg/L) found in the source zone. MW-72 is partially screened within silt layers whereas MW-68 and the vertical profile sample at MW-77 were in the sand layer.

The concentrations of cis-1,2-DCE at MW-72 and MW-77 suggest the potential for some limited mass of residual DNAPL beneath the building. Based on the vertical locations of the indicated samples it is likely that this mass is distributed between the sands and silt layer. In order to address this, the boring for the injection wells will be installed slightly into the silt layer.

As previously indicated, ethyl lactate exerts a strong co-solvency effect on chlorinated ethenes. Therefore, for the injections in the source area beneath the manufacturing plant, the ethyl lactate in Product ABC will be increased by 50-70% above its fraction in the standard Product ABC mixture. The use of this high ethyl lactate blend will increase desorption and diffusion of the chlorinated VOCs from the silt layer.

For each injection event, a total of 2,300 gal of high ethyl lactate ABC will be diluted into 20,700 gal of water for injection into the 45 wells. Each injection well will receive approximately 510 gal of amendment. Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of less than 5-10 psig. Injections will be simultaneously conducted on a row or array of eight wells. Including time for set up and take down between arrays, the Injections for this portion of the source area are anticipated to require approximately 55 hours.

Two injections are planned for the first year of the program. The need for additional injection in this area will be determined from monitoring of wells in this area over this time.

8.4.4 Amendment Mixing and Delivery System

Substrate will be stored within a weather proof building prior to use and delivered by forklift to the manufacturing plant as needed for each shift of injection operations

Material mixing and storage will be implemented using AMEC equipment and mixing containers. As shown is Figure 8-14, two separate make-up areas will be used to implement injections within the building. Each mixing area will be set up inside of a 10x24 ft speedi-berm enclosure. Each mixing process will consist of two 1,000-gallon, high density polyethylene (HDPE) tanks, transfer and mixing pumps, injection pump, flow and pressure instrumentation and control valves. The process equipment and the process flow diagram for material mixing was previously presented in Figure 8.10. Changes from the previously described system are summarized below.

Substrate concentrate will be transferred to the make-up process by a single phase, 220 V, 1.0 HP electrically-powered tote pump equipped with a flow totalizing meter and ancillary piping and controls. A tee will be fitted into the amendment transfer line to allow for rinsing out the system.

Water for amendment mixing will be supplied from an ancillary plant process water line that is located overhead in the vicinity of each make-up area. This will necessitate completing a tap into the auxiliary process line to connect a 1.0 in. Schedule 40 PVC branch that will be extended to directly overhead of each makeup area. Once the branch has been plumbed to the subject make-up area, an elbow and 5-10 ft section of pipe will be connected to the branch. This will serve as a downcomer for connection to the hoses for the make-up tank. Each downcomer will need to be provided with a quarter turn ball valve, PVC gate valve, flow totalizers, and camlock connection for connection of a hose to each make-up tank.

Mixing of the substrate concentrate and water to generate the injectate will be performed by an electrically-powered 0.75 HP, 220 V, single phase centrifugal pump capable of 30 feet of discharge head at 30 gpm. Pump operation will be controlled by manual switches located next to each pump. Electrical power for pump operation will be accessed from the plant. For each make-up area, a 220 V, single phase, 30 A circuit will be required. Power strips for single phase 220 V are limited to 12-16 A, and therefore, the primary electrical feed will need to provide at least two receptacles or two power strips.

After adequate mixing, valves in the blending line of the lead tank will be closed and valves for the lag tank will be opened to start the blending operation in the second tank. After switching the mixing operation to the second make-up tank, valves in the inlet line of the injection pump will be opened to begin the injection operation In order to begin injection, valves in the inlet and discharge lines of the injection pump will be opened to begin the injection operation. The injection pump will be an electrically-powered 1.0- 1.5 HP, 220 V, single phase centrifugal pump rated for 10-15 gpm of flow at 90 feet total discharge head. The pump head will be reduced to the desired well head pressures through pressure reducers and throttling valves installed in each injection branch. The injection pump will be controlled by a local manual switch. Connection from the tanks to the injection pump will be made by a combination of 1.0 in. Schedule 40 PVC pipe and 1.0 in. PVC hose.

The discharge from the pump will be connected to a distribution manifold that has flow totalizing instrumentation at its inlet. The distribution manifold provides for simultaneous injection into eight (8) wells and has flow control valves and flow and pressure instrumentation for each of the individual branches. Sections of 1.0 in. braided PVC hose with a rating of 150 psi will be used as the header for conveyance of the injectate to the injection well heads.

Up to eight (8) wells will be injected into simultaneously in each treatment area. In the source area inside the facility, two separate control boards will be required to complete the injections.

Delivery hoses rated for 150 psi applications will be equipped with cam lock fittings and connected to each well head assembly. Each well head assembly will be constructed from Schedule 40 PVC pipe and fittings (or equivalent) will be attached to each well head using a camlock fitting. Each well head assembly will be equipped with a ball valve.

8.4.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-67, MW-68, MW-71, MW-72, MW-76, MW-77, and MW-78. The frequency of monitoring and parameters are described in Section 11.

8.5 Downgradient Treatment Zone A -Enhanced Reductive Dechlorination

The area east of the manufacturing plant is divided into four downgradient treatment zones as previously shown in Figure 8.1. Each of these areas will be addressed by ERD. Biostimulation will be accomplished by injection of a various forms of ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.5.1 Injection Well Spatial Array

Data from MW-6C, MW-20, MW-62, MW-12, MW-82 and MW-13 in Treatment Zone A indicate considerable variability in the concentrations of chlorinated VOCs in Treatment Zone A. Additionally data from these wells indicate that the chlorinated VOC contamination is predominately within two vertical intervals. Wells MW-20, MW-6C, and MW-62 provide data for the upgradient portion of Treatment Zone A. Concentrations of cis-1,2-DCE at shallow depth (approximately 775-780 ft NAVD 88) in the upgradient portion of Treatment Zone A range from 360 µg/L at MW-20 to 2,400 µg/L at MW-62. The concentration of vinyl chloride at MW-20 (510 µg/L) is significantly lower than at MW-62 (2,000 µg/L). In the shallow interval at MW-6C, concentrations of cis-1,2-DCE (1,800 µg/L) and vinyl chloride (1,500 µg/L) are more similar to those observed at MW 62 than the results from well MW-20 which is closer.

The most significant concentrations of cis-1,2-DCE were found further downgradient in Treatment Zone A. In the shallow interval at MW-12 (775 -785 ft NAVD 88), cis-1,2-DCE was found at 11,000 µg/L. A vertical profiling sample at a similar interval at MW-82 found cis-1,2-DCE at 13,180 µg/L. Further downgradient at MW-13, the concentration of cis-1,2-DCE (3,000 µg/L) was similar to that found in the most upgradient portion of the treatment zone. Vertical profile samples at MW-82 at approximately 762 ft and 773 ft NAVD 88 found cis-1,2-DCE at approximately 4,900 µg/L. Vinyl chloride concentrations at these profile locations were above 5,000 µg/L.

In order to address this vertical contaminant profile, injection wells in Treatment Zone A will be installed as nested wells with two screened intervals of approximately 762 to 772 ft NAVD 88 and 777 to 782 ft NAVD 88. A total of 68 injection wells will be installed at 34 locations in Treatment Area A. Six injection locations (Array I) will be located to the east of the manufacturing plant. The screened intervals for these wells will be from 762 to 772 ft NAVD 88 and 777 to 782 ft NAVD 88. Twenty eight injection locations (Arrays J-N) will be located east of North Old US Highway 31 spanning an area approximately 125 ft. wide by 160 ft. long as shown in Figure 8-15. These wells will be screened at a slightly higher elevation (763 to 773 ft NAVD 88 and 778 to 783 ft NAVD 88).

The inferred area of influences for the injection wells in Treatment Zone A are also shown in Figure 8-15. Seepage velocities in the upper portion of Treatment Zone A from wells MW-20 and MW-6C to and from MW-12 to MW-82 are relatively low ranging from 0.06 to 0.09 ft /day. The inferred area of influence for wells in Arrays I-L, located between the manufacturing plant and MW-82 was based on data from the area of influence pilot test, local groundwater velocities, and estimated retardation of the amendment as 20 ft. wide by 25 ft. down gradient. With the exception of the injection wells in Array I directly east of the building, amendment injected in an upgradient well in this portion of Treatment Zone A will reach the successive downgradient array but will not overlap it. Amendment injected into wells on Array I (wells I.1-I.6) will project slightly beneath North Old US Highway 31. Due to right of way and access issues, installation of injection wells to the east of Array I closer to North Old US Highway 31 was not considered feasible.

Slightly greater seepage velocities (0.18 to 0.26 ft/day) were estimated for the well pair MW-82 to MW-13. Therefore, for Arrays M and N (injection well locations M.25-N.34), the area of influence extends slightly further down gradient (approximately 30 ft). Amendment injected within one of these arrays will reach the area of influence of the next downgradient array.

8.5.2 Injection Well Installation and Construction

Prior to injection well installation in Treatment Area A, the area that contains well locations in Arrays K and L [well locations K.13-K.18 and L.19-L.24)] and the southern part of Array M (M.25 and M.26) must be cleared of brush and graded to make it accessible for drilling equipment. AMEC will subcontract this work out to construction company.

The saturated thickness in this area between the silt or clay layer at approximately 754 ft NAVD 88 and the groundwater table at 784 ft NAVD 88 is approximately 30 ft. Groundwater VOC data for MW-20 indicates similar levels of cis-1,2-DCE (360 to 670 µg/L) and vinyl chloride (230-510 µg/L) at intervals of 760-765 ft NAVD 88 and 775-780 ft NAVD 88. However, cis-1,2-DCE was found at significantly greater concentration at MW-12 (11,000 µg/L) in the interval from 775-785 ft NAVD 88. Similar concentrations of cis-1,2-DCE (3,000 µg/L) were found in a similar interval further downgradient at MW-13. Vertical profile sampling at MW-82, indicated concentrations of cis-1,2-DCE ranging from 4,879 to 13,180 µg/L from approximately 761 ft NAVD 88 to just below the water table.

Accordingly, the screened intervals were placed to target these middle and upper zones.

Each borehole in Treatment Zone A will have a nested well pair installed at the appropriate depths. For Array I, the upper interval injection wells will be screened between 777-782 ft NAVD 88, and the lower interval will be screened from 762-772 ft NAVD 88 as show in Figure 8.16. For Arrays J-N, the upper interval will be from 778-783 ft NAVD 88 and the lower interval will be from 763 to 773 ft NAVD 88 as shown in Figure 8.17.

Unless otherwise noted in this section, injection well materials and installation will be installed in the same manner as described in section 8.3.2 of this work plan. The general construction will require placement of at least 6 inches of filter material at the bottom of the borehole to serve as a firm footing. The filter pack will be extended a minimum of 1 foot and a maximum of 2-feet above the top of each well screen. The bentonite seal for the lower well screen will vary in thickness as appropriate to install a minimum of 0.5 ft of filter pack beneath the upper screen. The bentonite seal for the upper screened interval will be a minimum 1-foot vertical thickness but no more than 2-foot thickness, consisting of medium grade crushed (1/4 to 3/8-inch) bentonite. The remainder of the annulus will be grouted as described in Section 8.3.2. The wells will consist of 1-inch-diameter, Type II, Schedule 40 PVC. Upper level injection wells in Treatment Area A will be constructed from threaded and gasketed casing, with a 5-foot, threaded, 0.020-inch slot well screen and threaded end cap. The lower level wells will have a 10-foot 0.020-inch slot well screen. Table 8.2 summarizes injection well construction details. Figure 8.18 provides construction details for the injection wells in Treatment Zone A.

At each location, the lower interval injection wells will be located up-gradient of the upper interval injection well inside the borehole, to minimize the adjacent wells' casing from altering the injectate distribution.

The top 3 feet of the well annulus will be filled with a concrete slurry consisting of approximately 25% sand and 75% Portland cement, with the flush mount protector cover installed in the concrete. Injection wells will be developed by surging or similar means until the well produces clear water.

8.5.3 Amendment Loading and Injection Parameters

The concentrations of cis-1,2-DCE at shallow depth (approximately 775 -780 ft NAVD 88) in the upgradient portion of Treatment Zone A range from 360 µg/L at MW-20 to 2,400 µg/L at MW-62. In the shallow interval at MW-6C, concentrations of cis-1,2-DCE (1,800 µg/L) and vinyl chloride (1,500 µg/L) were similar to those observed at MW-62. More elevated concentrations of cis-1,2-

DCE were found further downgradient in Treatment Zone A at MW-12 (775 -785 ft NAVD 88), where cis-1,2-DCE was found at 11,000 µg/L. A vertical profiling sample at a similar interval at MW-82 found cis-1,2-DCE at 13,180 µg/L. Vertical profile samples at MW-82 at approximately 762 ft and 773 ft NAVD 88 found cis-1,2-DCE at approximately 4,900 µg/L. Further downgradient at MW-13, the concentration of cis-1,2-DCE (3,000 µg/L) was similar to that found in the most upgradient portion of the treatment zone.

Although the highest concentrations of cis-1,2-DCE found in Treatment Zone A are significant, they are much lower than the highest concentrations found beneath the building at MW-72(32) (97,000 µg/L) or the vertical aquifer profiling sample at MW-77 (255,000 µg/L). The mean concentration of cis-1,2-DCE in Treatment Zone A is an order of magnitude less than the mean concentration beneath the building. The mean concentration of vinyl chloride in Treatment Zone A (2,178 µg/L) is five times less than its mean concentration beneath the building (11,500 µg/L).

The concentrations of cis-1,2-DCE in Treatment Zone A are not suggestive of residual DNAPL, therefore standard product ABC formulation will be used to promote reductive dechlorination in this area.

For each injection event, a total of 10,150 gal of standard product ABC will be diluted into 101,500 gal of water for injection into the 68 points. Each injection location or point will receive 3,280 gal of amendment with each injection interval receiving approximately 1,640 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of less than 5 psig. Three injection setups of 8 wells per setup and two setups with 6 wells will be performed for both the upper and lower intervals in Treatment Area A, equalling ten injection sets. Including time for set up and take down between arrays, the injections for this area are anticipated to require approximately 220 hours.

Two injections are planned for the first year of the program. The need for additional injection in this area will be determined from monitoring of wells in this area over this time.

8.5.4 Amendment Mixing and Delivery System

Prior to material delivery AMEC will cordon off an 25 ft. by 20 ft. area centrally located in Treatment Area A as show in Figure 8.15 for material and equipment storage. Orange barricade fencing will be used to cordon off the material and equipment staging area. Potable water for mixing will be piped to the equipment area in 1.5 in. fire hose from the flushing hydrant located in Treatment Area B.

Substrate will be stored within a weather proof building prior to use and delivered by forklift to the treatment zone as needed for injection operations. If injections are conducted during warmer weather, Product ABC totes that are not in immediate use may be stored adjacent to the material and equipment storage area covered by a tarp. Staging area storage of Product ABC will be limited to 4-6 totes sufficient for two to three days of injection operation. If injection operations are conducted during cold weather (temperatures of less than 35 F) substrate will be stored within a heated building or enclosure before use. Under these circumstances no more than three totes will be maintained at the staging and mixing operation at a time. Additionally, the product amendment will be kept warm by placing it within a tent or similar enclosure and maintaining above freezing temperatures with a propane or electrically operated forced air heater.

Figure 8-10 previously presented the process equipment and the process flow diagram for material mixing. The material mixing process will consist of two 1,700-gallon, high density polyethylene (HDPE) tanks, transfer/mixing pumps, injection pump, flow and pressure instrumentation and control valves. Mixing of the substrate concentrate and water to generate the injectate will be performed by an electrically-powered 0.75 HP, 220 V, single phase centrifugal pump capable of 30 feet of discharge head at 30 gpm. Pump operation will be controlled by manual switches located next to each pump. Electrical power for pump operation will be provided by a portable generator. After adequate mixing, valves in the blending line of the lead tank will be closed and valves for the lag tank will be opened to start the blending operation in the second tank. After switching the mixing operation to the second make-up tank, valves in the inlet line of the injection pump will be opened to begin the injection operation In order to begin injection, valves in the inlet and discharge lines of the injection pump will be opened to begin the injection operation. The injection pump will be an electrically-powered 1.0 to 1.5 HP, 220 V, single phase centrifugal pump rated for 10-15 gpm of flow at 90 feet total discharge head. The pump head will be reduced to the desired well head pressures through pressure reducers and throttling valves installed in each injection branch. The injection pump will be controlled by a local manual switch. Connection from the tanks to the injection pump will be made by a combination of 1.0 in Schedule 40 PVC pipe and 1.0 in PVC hose.

8.5.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-6C, MW-12, MW-13, MW-62, MW-20, and MW-82. As subsequently described in Section 8.9, one additional nested monitoring well OW-1 will need to be installed in Treatment Area A to provide adequate coverage for performance monitoring across the zone. The frequency of monitoring and parameters are described in Section 11.

8.6 Downgradient Treatment Zone B -Enhanced Reductive Dechlorination

The second treatment area downgradient from the Plant is identified as Treatment Zone B (Figure 8.1). Biostimulation in this area will be accomplished by injection of ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.6.1 Injection Well Spatial Array

Chlorinated VOC concentrations for Treatment Zone B are limited to data from MW-14 and MW-24. Current concentrations of cis-1,2-DCE (55 µg/L)and vinyl chloride(4.2 µg/L) at MW-14 are very limited. However, the parent compound TCE has been detected at MW-14 at concentrations as high as 680 µg/L in the past several years and the current TCE concentration in this well is 320 µg/L. The appearance of TCE in MW-14 is noteworthy because this parent compound has not been routinely detected in the monitoring wells in upgradient Treatment Zone A. MW-14 is screened from approximately 758-768 ft NAVD 88. Monitoring well MW-24 is a nested well with screened intervals at approximately 780-785 ft NAVD 88 and 750-755 ft NAVD 88. Concentrations of chlorinated VOCs in the upper interval of MW-24 have been at or below detection limits. Concentrations of cis-1,2-DCE and vinyl chloride in the lower interval have also routinely been similar to those observed at MW-14. Similar to MW-14 TCE has been routinely detected in the lower interval of MW-24(55.4) with the most recent concentration at 110 µg/L. Concentrations of TCE in this interval at MW-24 have consistently been at 110-180 µg/L over five years of monitoring.

Upgradient at MW-13, TCE has been at non-detect or very low levels but the recent concentrations of cis-1,2-DCE (3,000-10,000 µg/L) are much higher than found at MW-14. Vinyl chloride concentrations at MW-13 (440-1,600 µg/L) are also much higher than found in MW-14. MW-13 is screened at approximate elevation from 775-785 ft NAVD 88.

Monitoring well MW-13 is only 45 feet upgradient of Treatment Zone B. Although monitoring data are not available for an interval of 775-785 ft for Treatment Zone B, chlorinated VOCs in this upper interval will be advectively transported into the downgradient treatment zone. In order to address this vertical contaminant profile, thirty-nine (39) injection wells will be installed at seventeen (17) locations in Treatment Zone B. Each location will have two injection wells, one for an upper and one for a lower interval. The upper injection interval (770 to 780 ft NAVD 88) is intended to address VOCs advectively transported from the upper interval at MW-13. The lower interval will be screened from 758 to 768 ft NAVD 88 to address VOC contamination observed at MW-14.

Locations 9 and 14 will have a third injection well for a deep interval at 750-755 ft NAVD 88. Locations 15 through 17 will also have a third injection well at 748 to 753 ft NAVD 88 to address the deeper contamination observed in the silt layer at MW-24. If the silt layer at MW-24 at approximately 760 ft NAVD 88 (figure 3-7) and MW-84 at 760 ft NAVD 88 (Figure 3-8) is found to be continuous across the downgradient portion of Treatment Zone B and sampling conducted during installation of injection and monitoring wells indicates significant concentrations of TCE, additional deep wells may need to be added at locations 10-13.

Seepage velocities in the upper portion of Treatment Zone B were estimated to range from 0.21 to 0.26 ft/day. Groundwater velocity is much greater in the downgradient portion of Treatment Zone B from MW-14 to MW-15 (approximately 0.9 ft/day). The inferred area of influence of 40 ft. downgradient as shown in Figure 8.15 was based on the average groundwater velocities across the Treatment Zone, and estimated retardation of the amendment. In the upper portion of the Treatment Zone, overlap of the amendment distribution patterns may not occur. In the lower portion of the Treatment Zone, amendment injected in an upgradient array is expected to be advectively carried into the zone of influence of the successive downgradient array. Based on the limited VOC concentrations observed in this Treatment zone, this approach provides a pragmatic balance between amendment distribution and drilling costs.

Amendment distribution in the lower interval at locations 9, 14, and 15-17, is not expected to extend over the area of influence indicated in Figure 8.15. However, limited data are available concerning the lateral extent of contamination in the silt layer. Additional data concerning the lateral extent of VOC contamination in this area will be obtained during installation of these injection wells. Based on that data and the response to injections on the planned wells, additional injection wells may be needed in the deep interval in this area.

8.6.2 Injection Well Installation and Construction

At each location, separate wells will be installed for the upper and lower screened intervals. The upper interval will be screened from 770 to 780 ft NAVD 88. The lower injection well will be screened from 758 to 768 ft NAVD 88 as shown in Figure 8.17. Separate boreholes for separate injection wells are required because the separation between the screened intervals in inadequate to prevent communication between the wells. The borehole for the lower interval will be installed to a depth of 758 ft NAVD 88 or to the top of the clay/silt layer if that is encountered before the specified elevation. These two intervals provide treatment coverage for the saturated thickness located above the clay and silt aquitard.

Locations 9, 14, and 15 through 17 will have a deep injection well with a five (5) ft. screened interval installed into the clay/silt layer at approximately 750 to 755 ft or 748 to 753 ft NAVD 88 as previously described. The top of the screened interval will be installed at least 3 ft. into the clay/silt layer to ensure that injectant enters this layer and does not short-circuit into the more permeable sand layer. The deeper injection interval in Treatment Area B targets the contamination that is present in the silt layer, indicated by groundwater data from MW-24. The bottom of the screened interval of MW-14 rests atop this silt layer, while MW-24 is screened entirely in the silt as shown in Figure 8.17.

In Treatment Area B each borehole will have a single injection well installed. Unless otherwise noted in this section, injection well materials and installation will be as described in Section 8.3.2 of this work plan. The general construction will require placement of at least 6 inches of filter material at the bottom of the borehole to serve as a firm footing. The filter pack will be extended a minimum of 1 foot and a maximum of 2-feet above the top of each well screen. For the deep wells at locations 9, 14, and 15 through 17, the filter pack should extend 1.0 ft above the screen. The bentonite seal will be a minimum 1-foot vertical thickness but no more than 2-foot thickness. For deeper wells installed at locations 9, 14, and 15 through 17 the bentonite seal shall be 2 ft thickness. The remainder of the annulus will be grouted as described in Section 8.3.2.

The wells will consist of 1-inch-diameter, Type II, Schedule 40 PVC. At each location, the injection wells will be staggered approximately five (5) ft. apart from one another in the down gradient direction, proceeding from deepest to shallowest intervals to prevent an adjacent wells' casing from altering the injectate distribution. Upper and lower level injection wells in Treatment Zone B will be constructed from threaded and gasketed casing, with a 10-foot, threaded, 0.020-inch slot well screen and threaded end cap. The deep wells at locations 9,14, and 15 through 17 will have a 5-foot 0.020-inch slot well screen. Figure 8.18 and Table 8.2 summarizes injection well construction details.

Each injection well will be completed at the surface with a flush mount protective cover set in a concrete pad. The top of the injection well casing will have a female slip to NPT threaded adapter, a male camlock connection and a female camlock cap on the top of the 1-inch PVC casing. Injection wells will be developed by surging or similar means until the well produces clear water.

During the injection well installation, borehole locations 9, 10 and 17 in Treatment Zone B will be sampled at continuous intervals using a standard split spoon sampler, or equivalent device, depending on field conditions. Standard penetration test N values will be recorded at each sample point. Retrieved soil samples will be visually examined to assess subsurface conditions and physical properties of the strata. These properties include: color, moisture content, and visual evidence of discoloration. Additionally, all soil samples will be field screened for evidence of volatile organic vapors via conventional headspace analysis techniques using a photoionization detector equipped with a 10.0 eV lamp.

8.6.3 Amendment Loading and Injection Parameters

TCE has been detected at MW-14 at limited concentrations ranging from 320 to 680 µg/L Concentrations of cis-1,2-DCE (55 µg/L) and vinyl chloride (4.2 µg/L) at MW-14 are very limited. Concentrations of chlorinated VOCs in the upper interval of MW-24 have been at or below detection limits. TCE has also been found in the deeper interval at MW-24 at 110-180 µg/L over the past five years of monitoring. However, concentrations of cis-1,2-DCE in the deep interval at MW-24 are similar to those at MW-14 and vinyl chloride has been below detection limits.

The concentrations of chlorinated VOCs in Treatment Zone B are an order of magnitude lower than in Treatment Zone A and are not suggestive of residual DNAPL. Standard product ABC formulation will be used to promote reductive dechlorination in this area.

For each injection event, a total of 4,420 gal of standard ABC will be diluted into 44,200 gal of water for injection into the 34 upper and lower wells. Each of these injection wells will receive approximately 1,430 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and well head pressures of less than 5 psig. For injection in the upper and lower wells, two setups of 6 wells and one setup with 5 wells will be performed for each interval equalling six injection sets. Including time for set up and take down between arrays, the Injections for this area are anticipated to require approximately 117 hours.

Separate injection will be required for the deep interval at locations 9, 14, and 15 through 17. For these wells a total of 350 gal of ABC will be diluted into 3,500 gal of water for injection in the five wells. Each well will receive approximately 770 gal of amendment. Injection will be conducted at rates of 0.5 -1.0 gpm and pressures at the discharge side of the control board of 10-20 psig. Injections for this area are anticipated to require approximately 12 hours.

Two injections are planned for the first year of the program. The need for additional injection in this area will be determined from the results of the performance groundwater monitoring.

8.6.4 Amendment Mixing and Delivery System

AMEC will cordon off a 25 ft. by 25 ft. area centrally located in Treatment Area B as show in Figure 8.15 for material and equipment storage. Orange barricade fencing will be used to cordon off the material and equipment staging area. Potable water for mixing will be piped to the equipment area via 1.5 in. diameter fire hose from the flushing hydrant located in Treatment Area B. Delivery hoses for injection wells located north of the access road will be placed in a drive over hose guard across the access road to protect them from damage.

Substrate will be stored within a weather proof building prior to use and delivered by forklift to the treatment zone as needed for injection operations. During warmer weather, Product ABC totes that are not in immediate use may be stored adjacent to the material and equipment storage area and covered by a tarp. Staging area storage of Product ABC will be limited to 2-4 totes. If injection operations are conducted during cold weather (temperatures of less than 35 F) substrate will be stored within a heated building or enclosure before use.

Figure 8-10 previously presented the process equipment and the process flow diagram for material mixing. The material mixing process will consist of two 1,700-gallon, high density polyethylene (HDPE) tanks, transfer/mixing pumps, injection pump, flow and pressure instrumentation and control valves. The mixing and injection process for the upper and lower interval wells was previously described in Section 8.5.4.

The system used for injection of amendment in the upper and lower intervals of Treatment Zone B will also be used for injection in the deep zone with the exception that the injection pump will be replaced with a multi-stage centrifugal pump. The pump that will be used for injection in the deep zones will be a 0.5 HP, 230 V, single phase 7 stage, centrifugal pump, capable of discharge heads of 60 to 90 psi at flows of 3-6 gpm. Pump head will be reduced to the desired well head pressures through pressure reducers and throttling valves installed in each injection branch.

8.6.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-14, MW-24, and newly installed monitoring wells OW-2 and OW-3. Additional monitoring wells OW-2 and OW-3 will be nested wells installed in Treatment Area B and C to provide adequate coverage for performance monitoring across the zone. Details concerning the installation of OW-2 and OW-3 installation are provided in Section 8.9. The frequency of monitoring and parameters are described in Section 11.

8.7 Downgradient Treatment Zone C - Enhanced Reductive Dechlorination

The third treatment area downgradient from the Plant, is identified as Treatment Zone C (Figure 8.1). Biostimulation in this area will be accomplished by injection of modified ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.7.1 Injection Well Spatial Array

Chlorinated VOC concentrations for Treatment Zone C are limited to data from MW-15. Similar to MW-14 in Treatment Zone B, TCE has been routinely detected at MW-15 at concentrations ranging from 15-240 µg/L with the most recent TCE concentration at 160 µg/L. Concentrations of cis-1,2-DCE and vinyl chloride at MW-15 are greater than observed at MW-14. At MW-15, cis-1,2-DCE has ranged from 1,300 to 5,000 µg/L with a mean concentration over the past five years of 2,560 µg/L. Vinyl chloride concentrations have ranged from 220-1,300 µg/L with a mean concentration of 460 µg/L. Well MW-15 is screened at 738-748 ft NAVD 88.

The concentrations of TCE in Treatment Zone B are similar to that observed at MW-15 with concentrations as high as 680 µg/L in the past several years and the most recent concentration at 320 µg/L. The concentrations of daughter product VOCs at MW-15 in Treatment Zone C are one to two orders of magnitude higher than in upgradient Treatment Zone B. Current concentrations of cis-1,2-DCE (55 µg/L) and vinyl chloride (4.2 µg/L) at MW-14 are very limited. MW-14 is screened from approximately 758-768 ft NAVD 88 or 20 ft higher than MW-15.

MW-25 is located at the upgradient end of Treatment Zone D. MW-25 provides monitoring data for five discrete depth intervals. Concentrations of chlorinated VOCs in the two deep intervals of MW-25 are generally below RCLs and are often below MDLs. The upper interval of MW-25 is from approximately 776-781 ft NAVD 88. TCE has not been detected in this interval but the concentrations of cis-1,2-DCE are similar to those found at greater depth (738-748 ft NAVD 88) at MW-15. In this upper interval of MW-25, mean concentrations of cis-1,2-DCE and vinyl chloride over the past four years have been 1,850 µg/L and 700 µg/L, respectively. At depth interval of 760-765 ft NAVD 88 at MW-25, the most recent concentration of cis-1,2-DCE was 1,500 µg/L and the mean concentration for the past four years was 595 µg/L. The mean vinyl chloride concentration for this interval at MW-25 was 320 µg/L.

In the deeper interval at downgradient MW-25 (747-752 ft NAVD 88), the most recent concentrations of cis-1,2-DCE and vinyl chloride in 2010 were 750 µg/L and 92 µg/L, respectively. Concentrations of cis-1,2-DCE and vinyl chloride decrease with depth at MW-25 The 747-752 ft NAVD 88 depth interval generally corresponds with the interval of MW-15 but concentrations are an order of magnitude lower than observed at the monitoring well in Treatment Zone C.

The screened intervals for the injection wells in Treatment Zone C were selected to address the VOC contamination observed at MW-15 and bridge with the contamination observed in the various depth intervals of MW-25. In order to address this vertical contaminant profile, twenty (20) injection wells will be installed at ten (10) locations in Treatment Zone C. Each location will have two injection wells, one for an upper and one for a lower interval. The upper injection interval (764 to 774 ft NAVD 88) is intended to bridge the VOCs observed in the second interval at MW-25. The lower interval will be screened at two separate depths. For wells in Array S (S.1-S.5) the lower interval will be set at 745 to 755 ft NAVD 88 to address VOC contamination observed at MW-15. The bottom of this screened interval should be set slightly into or upon the silt and clay layer at approximately 745 ft NAVD 88. For wells in Array T (locations T6-T10), the lower interval wells will be screened from approximately 740-750 ft NAVD 88. This interval corresponds with the interval of MW-15 and provides a bridge with the third interval of MW-25.

Seepage velocities in the upper portion of Treatment Zone C (MW-14 to MW-15) were estimated at approximately 0.9 ft/day. Groundwater velocity from MW-14 to MW-25(32) was estimated at 0.55 ft /day. Groundwater velocity is significantly lower (0.1 ft /day) in the deeper interval of the downgradient portion of the Treatment Zone (from MW-15 to MW-25 at approximately 740-750 ft NAVD 88). Groundwater velocity increases significantly to greater than 1.2 ft per day in Treatment Zone D. The inferred area of influence of 50 ft. downgradient as shown in Figure 8.15 was based on the groundwater velocities across the Treatment Zone and estimated retardation of the amendment. In the upper intervals of the Treatment Zone, overlap of the amendment distribution patterns is expected to occur. In the lower intervals of the Treatment Zone, amendment injected in an upgradient array will likely not overlap into the zone of influence of the successive downgradient array. However, TCE has not been detected in the lower interval at MW-25 and the concentrations of cis-1,2-DCE and vinyl chloride are an order of magnitude lower at MW-25 than MW-15. Additionally, the first injection array in Treatment Zone D is upgradient of MW-25 and therefore this approach provides a pragmatic balance between amendment distribution and drilling costs.

8.7.2 Injection Well Installation and Construction

Each location will have two injection wells, one for an upper and one for a lower interval. At each location, the upper interval will be installed with a screened section from 764 to 774 ft NAVD 88. For wells in Array S (S.1-S.5) the lower interval will be set at 745 to 755 ft NAVD 88 to address VOC contamination observed at MW-15. The bottom of this screened interval should be set slightly into the silt and clay layer at approximately 745 ft NAVD 88. For wells in Array T (locations T6-T10), the lower interval wells will be screened from approximately 740-750 ft NAVD 88 as shown in Figure 8.17. The lower interval will be installed to a depth of 740 or to the top of the clay/silt layer potentially located at approximately 740-745 NAVD 88. These two intervals provide treatment coverage for the saturated thickness located above the clay and silt aquitard and provide a bridge between MW-15 and the lower interval of MW-25. At each location, the lower interval injection wells will be located up-gradient of the upper interval injection well inside the borehole, to minimize the adjacent wells' casing from altering the injectate distribution.

Unless otherwise noted in this section, injection well materials and installation will be as described in section 8.3.2 of this work plan. Upper and lower level injection wells in Treatment Zone C will be constructed from threaded and gasketed casing, with a 10-foot, threaded, 0.020-inch slot well screen and threaded end cap. Each injection well will be completed using flush mount protective cover set in concrete. The top of the injection well casing will have a female slip to NPT threaded adapter, a male camlock connection and a female camlock cap. Figure 8.18 (previously presented) and Table 8.2 summarizes injection well construction details.

8.7.3 Amendment Loading and Injection Parameters

TCE has been routinely detected at MW-15 at concentrations ranging from 15-240 µg/L with the most recent TCE concentration at 160 µg/L. At MW-15, the mean concentration of cis-1,2-DCE over the past five years was 2,560 µg/L. Vinyl chloride has exhibited a mean concentration of 460 µg/L.

Concentrations of cis-1,2-DCE and vinyl chloride in Treatment Zone C are greater than observed in Treatment Zone B. However, downgradient concentrations at MW-25 are similar to those observed at MW-15. In the upper interval of MW-25, mean concentrations of cis-1,2-DCE and vinyl chloride over the past four years have been 1,850 µg/L and 700 µg/L, respectively. At depth interval of 760-765 ft NAVD 88 at MW-25, the mean concentration of cis-1,2-DCE for the past four years was 595 µg/L. The mean vinyl chloride concentration for this interval at MW-25 was 320 µg/L.

Amendment loading and selection was based on the concentrations observed in both Treatment Zone C and the upper portion of Treatment Zone D, differences in concentration with depth, and differences in seepage velocities across different depth intervals. Different amendments will be used in the upper and lower injection wells in Treatment Zone C.

For each injection event, a total of 2,980 gal of modified ABC will be diluted into 26,800 gal of water for injection into the upper interval wells. For these wells the higher end fatty acids in ABC will be increased by 30-40% above its fraction in the standard ABC to increase retardation. Each of these injection wells will receive approximately 2,978 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of less than 5 psig. For injection in the upper interval wells, two setups of 7-8 wells and one setup with 2-3 wells will be performed for each interval equalling six injection sets. Including time for set up and take down between arrays, the Injections for this area are anticipated to require approximately 117 hours.

Separate injection will be required for the deep wells. For each injection event, a total of 2,980 gal of standard ABC will be diluted into 26,800 gal of water for injection into the deeper wells. Each of these injection wells will receive approximately 2,978 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of less than 5 psig. For injection in the lower wells, two setups of 7-8 wells and one setup with 2-3 wells will be performed. Total injection time is estimated at 144 hours.

Two injections are planned for the first year of the program. The need for additional injection in this area will be determined from the results of the performance groundwater monitoring.

8.7.4 Amendment Mixing and Delivery System

AMEC will cordon off a 35 ft. by 35 ft. area in Treatment Area C as show in Figure 8.15 for material and equipment storage. Orange barricade fencing will be used to cordon off the material and equipment staging area. Potable water for mixing will be piped to the equipment area via 1.5 in. diameter fire hose from the flushing hydrant located in Treatment Area B. Delivery hoses for injection wells located north of the access road will be placed in a drive over hose guard across the access road to protect them from damage.

Substrate will be stored within a weather proof building prior to use and delivered by forklift to the treatment zone as needed for injection operations. During warmer weather, Product ABC totes that are not in immediate use may be stored adjacent to the material and equipment storage area and covered by a tarp. Staging area storage of Product ABC will be limited to 2-4 totes. If injection operations are conducted during cold weather (temperatures of less than 35 F) substrate will be stored within a heated building or enclosure before use.

Figure 8-10 previously presented the process equipment and the process flow diagram for material mixing. The material mixing process will consist of two 1,700-gallon, high density polyethylene (HDPE) tanks, transfer/mixing pump, injection pump, flow and pressure instrumentation and control valves. The mixing and injection process for the upper and lower interval wells was previously described in Section 8.5.4.

8.7.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-15, MW-25, and newly installed monitoring wells OW-3 and OW-4. Additional monitoring wells OW-3 and OW-4 will be nested wells installed in Treatment Area C to provide adequate coverage for performance monitoring across the zone. Details concerning their installation are provided in Section 8.9. The frequency of monitoring and parameters are described in Section 11.

8.8 Downgradient Treatment Zone D -Enhanced Reductive Dechlorination

The fourth treatment area, downgradient from the Plant, is identified as Treatment Zone D (Figure 8.1). Biostimulation in this area will be accomplished by injection of modified ABC into an array of permanently installed injection wells. Details for the injection array layout, injection well construction, amendment loading and amendment delivery system are provided in this section.

8.8.1 Injection Well Spatial Array

MW-25 is located at the upgradient end of Treatment Zone D. MW-25 provides monitoring data for five discrete depth intervals. As previously indicated, concentrations of COCs are generally below RCLs (and MDLs) in the two deepest intervals of MW-25. The upper interval of MW-25 is from approximately 776-781 ft NAVD 88. TCE has not been detected in this interval but mean concentrations of cis-1,2-DCE and vinyl chloride over the past four years have been 1,850 µg/L and 700 µg/L, respectively. At depth interval of 760-765 ft NAVD 88 at MW-25, the most recent concentration of cis-1,2-DCE was 1,500 µg/L and the mean concentration for the past four years was 595 µg/L. The mean vinyl chloride concentration for this interval at MW-25 was 320 µg/L

Wells at the downgradient edge of Treatment Zone D include MW-26, MW-16, MW-17, and the pilot test wells ZVI -1 and ZVI-2. The two upper intervals of MW-26 generally correspond with the upper intervals of MW-25. Very limited concentrations of TCE have been observed in the upper interval of MW-26. Mean concentrations of cis-1,2-DCE (1,170 µg/L) and vinyl chloride (530 µg/L) in the 775-780 ft NAVD 88 interval of MW-26 are similar to the mean concentrations observed in the upper interval at MW-25. The mean cis-1,2-DCE (203 µg/L) and vinyl chloride (81 µg/L) concentrations at the 762-767 ft NAVD 88 interval in MW-26 are somewhat lower than at the second depth interval monitored at MW-25.

MW-16, with a screened interval of approximately 758-763 ft NAVD 88 has exhibited limited concentrations of TCE with a mean level of 37 µg/L. Mean concentrations of cis-1,2-DCE (310 µg/L) and vinyl chloride (184 µg/L) are similar to the concentrations observed at this interval in MW-26. The mean concentrations of cis-1,2-DCE and vinyl chloride at this interval in MW-16 and MW-26 are somewhat lower than in the corresponding interval in MW-25

In the interval from 747-752 ft NAVD 88 at MW-25, the concentrations of cis-1,2-DCE and vinyl chloride in 2010 were 390 µg/L and 170 µg/L, respectively. The mean concentrations of these VOCs at this interval in MW-25 were similar to but somewhat lower than observed in the upper intervals. Well MW-17 on the eastern edge of Treatment Zone D is screened from approximately 743-748 ft NAVD 88. At MW-17, TCE has been routinely observed from 190 -340 µg/L. cis-1,2-DCE concentrations at MW-17 are lower than at other wells in the southern extent of Treatment Zone D. Vinyl chloride has not been routinely detected at MW-17.

The data from MW-25 and the wells along the southern extent of Treatment Zone D indicate that the injection well field should have three discrete intervals. These intervals are approximately 775-780 ft NAVD 88, 760-765 ft NAVD 88 and 745-750 ft NAVD 88.

Seepage velocities in the upper intervals of Treatment Zone D from approximately 775-780 ft NAVD 88 for well pair MW-25 and MW-26 were estimated at approximately 1.8-2.0 ft/day. Seepage velocities (1.6 to 1.8 ft/day) were also very elevated in the subsequent depth interval from 760-765 ft NAVD 88 for well pair MW-25 to MW-26. The estimated groundwater velocity (1.2 to 1.3 ft/day) is somewhat lower in the deeper interval at approximately 745 -750 ft NAVD 88 (based on well pair MW-25 to MW-26 and MW-25 to MW-17).

These very elevated groundwater velocities in Treatment Zone D present challenges for both ERD and ISCR treatment approaches. In the case of ERD using relatively water soluble amendments, the groundwater velocities will result in significant advective transport from the injection well with a corresponding limited residence time of the substrate within the treatment zone. Where relatively water soluble amendments are used as the carbon fraction for the ISCR, a similar result occurs. These issues were observed in the ZVI Pilot Test where the more soluble fractions of the ABC migrated relatively rapidly from the injection points providing an initial increase in TOC that was rapidly lost.

The preferred alternative in the FS included an injectable ZVI wall at the end of the treatment zone D. This design has retained a similar conformation but has replaced the ZVI with a liquid amendment that can be more easily and readily replenished than ZVI if that is indicated as necessary by post–injection monitoring.

Two arrays of points for injection of a higher fatty acid fraction of ABC, similar to that specified for Treatment Zone C, will be installed in the upgradient portion of Treatment Zone D to provide stimulus for ERD in the immediate downgradient area of MW-25 and much of the treatment zone. The inferred area of influence ranges from 50 to greater than 70 ft. downgradient depending on the groundwater velocity in a given depth interval. The inferred area of influence as shown in Figure 8.15 was based on the average groundwater velocity across the Treatment Zone and estimated retardation of the amendment.

Two arrays of injection wells will be installed in the southern portion of Treatment Zone D with the first array approximately 30 ft upgradient from well MW-26. The second array will be located approximately 15 ft upgradient from MW-26. These wells will be used to inject a modified form of ABC, referred to as ABC-ole. ABC-ole is a modification of standard ABC that contains a high mass fraction of oleic acid. Oleic acid is the initial product formed from the hydrolyses of emulsified vegetable oil substrates. Oleic acid is strongly adsorbed to soils and has limited mobility in the environment. This ABC formulation will provide an initial relatively quick release of carbon to stimulate reductive dechlorination. The oleic acid fraction is relatively immobile in advective groundwater flow. Similar to emulsified oil substrates the oleic acid fraction provides approximately an order of magnitude greater mols of electron donor relative to more water soluble substrates. Therefore, following the initial release of the more soluble fractions and initial stimulus for ERD, this substrate will provide a very sustained release of electron donor as the oleic acid and its daughters are slowly hydrolyzed.

As indicated in Figure 8-15, the area of influence of the upgradient injection arrays does not extend entirely to the arrays used for injection of ABC-ole. Injection wells were not installed between these sets of arrays in order to prevent the more soluble amendment used in the upgradient zone from being carried into the downgradient biobarrier which might reduce its effectiveness. Additionally this area was retained for a possible contingent installation of ZVI if post remedial monitoring indicates such an approach is needed.

The ZVI Pilot injection indicated influence from the edge of the ZVI array to approximately 15 ft downgradient with some propagation to 20 ft. For arrays W and X (Figure 8.15), the inferred radius of influence of approximately 15 ft downgradient is based on those results, localized groundwater velocity the anticipated immobility of the amendment.

This design has retained a biobarrier conformation similar to the preferred alternative in the FS which was based on an injectable ZVI wall at the end of the treatment zone D. The use of an injectable ZVI will be retained as a contingency approach if post injection monitoring indicates that the oleic acid based biobarrier is subject to relatively rapid degradation due to the high transport velocities in this part of the plume. In order to provide adequate space for that contingency, the injection arrays were located 15-30 ft upgradient from MW-26.

Injection wells W-12 through W-14 and injection wells X-23 through X-25 are located in the area of the ZVI pilot injections. During the ZVI pilot study, ABC+ was injected from 45 to 10 ft bgs at pressures equal to or slightly greater than 100 psi. Daylighting did not occur in the pilot study except at MW-16 during injection at INJ-8. At the conclusion of the ZVI pilot study, the injection boreholes were plugged with bentonite.

There is some limited possibility that plugging the pilot study injection points with bentonite might provide a preferential pathway for daylighting during injection of ABC-ole in the upper interval wells at locations W-12 through W-14 and X-23 through X-25. The potential for daylighting is considered very limited since ABC+ injections within 10 ft of surface at elevated pressures did not result in daylighting and Treatment Zone D injections will be conducted at very low pressures. Additionally, the bentonite column to within approximately five feet of surface would have been adequately hydrated since this is within the saturated zone and the upper five feet of bentonite would be adequately hydrated during its placement and subsequent infiltration of precipitation.

Two additional arrays (Y and Z) of injection wells are located along the eastern edge of Treatment Zone D to address VOC levels observed at MW-17.

8.8.2 Injection Well Installation and Construction

During the field effort, borehole locations # 1, 5, 8, 12, 18, 26, and 34 will be drilled first to assess the occurrence and thickness of silt lenses in Treatment Area D. Soil samples will be collected in continuous intervals from each borehole using a standard split spoon sampler, or equivalent device, depending on field conditions. Standard penetration test N values will be recorded at each sample point. Retrieved soil samples will be visually examined to assess subsurface conditions and physical properties of the strata. These properties include: color, moisture content, and visual evidence of discoloration. This lithological data will be combined with data collected during the monitoring well installation to develop a more robust cross section for Treatment Area D. Additionally, all soil samples will be field screened for evidence of volatile organic vapors via conventional headspace analysis techniques using a photoionization detector equipped with a 10.0 eV lamp.

At each injection location a lower, intermediate, and upper interval will be installed as shown in Figure 8.17. Each interval's elevation will be determined more precisely after an updated cross-section is developed from the sampling of the initial boreholes. The objective is to avoid installing any screened intervals in a silt lense. If a silt lense is present in the specified interval, the bottom of the screened section will be installed on top of or only slightly into the silt for each injection well.

The bottom of upper screened interval will be located approximately 775 (Arrays Y and Z) to 778 ft NAVD 88 (Arrays U-X). The bottom of the intermediate injection wells' screened interval contact a silt lense that occurs at approximately 760 ft NAVD 88. For Arrays Y and Z the bottom of the screened interval will be approximately 763 ft NAVD 88. The lower screened interval for Arrays U, V, W, and X will be installed at approximately 745-750 ft NAVD 88. For Arrays Y and Z, the bottom of the lower interval will be at approximately 742 ft NAVD 88. The preliminary screened intervals for these injection wells are provided in Table 8-2.

Unless otherwise noted in this section, injection well materials and installation will be as described in section 8.3.2 of this work plan. All of the intervals in Treatment Area D, except the upper interval in Array W and X will be constructed from threaded and gasketed casing, with a 5-foot, threaded, 0.020-inch slot well screen and threaded end cap. The upper interval injection wells in Arrays W and X will have 3-foot , 0.020-inch slot screen. Specific well construction details are in Figure 8.18 and Table 8.2. Each injection well will be completed at the surface using a flush mount protective cover set in concrete for Arrays U, V W and X. However, due to the topography in Arrays W and X injection well locations W19, W20, W21 and X29, X30 ,and X31 will be completed with a minimum 2-foot above grade stick up with a female slip to NPT threaded adapter, a male camlock connection and a female camlock cap on the top of the 1-inch PVC casing. Arrays Y and Z will also require above ground well completions. The top 3 feet of the well annulus will be filled with a concrete slurry consisting of approximately 25% sand and 75% Portland cement, with the steel well protector installed in the concrete extending 2.5 feet below the surface.

8.8.3 Amendment Loading and Injection Parameters

Two arrays (U and V) of points for injection of a higher fatty acid fraction of ABC, similar to that specified for Treatment Zone C, will be installed at the upgradient edge of Treatment Zone D. For each injection event for this array, a total of 9,200 gal of modified product ABC will be diluted into 73,600 gal of water for injection into the Array U and V wells. For these wells the higher end fatty acids in Product ABC will be increased by 30-40% above its fraction in the standard Product ABC. Each of these injection wells will receive approximately 2,760 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of less than 5 psig. For injection in the Array U and V wells four injection setups will be required. The total time for each injection event on these Arrays is approximately 120 hours. Three injections are planned for the first year of the program. The need for additional injection in this area will be determined from monitoring of wells in this area over this time.

Arrays W and X contain 21 injection locations with three intervals for injection of ABC-ole. For these wells, ABC-ole will contain approximately 40% oleic acid fraction. For each injection event, the upper interval in these arrays will receive a total of 987 gal of ABC-ole diluted into 4,940 gal of water. For the remaining Array W and X wells (intermediate and lower intervals), 1,975 gal of ABC-ole will be diluted into 17,766 gal of water for injection into the 42 wells. Approximately

470 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of 5 psig. For injection in Arrays W and X, eight injection setups will be required. The total time for each injection event on this Array is approximately 120 hours. One injection is planned for the first year of the program. The need for additional injection in this area will be determined from the results of the performance groundwater monitoring.

Arrays Y and Z contain seven injection locations with three intervals for injection of ABC-ole. For each injection event for these arrays, a total of 1,800 gal of ABC-ole will be diluted into 12,600 gal of water for injection into the Array Y and Z wells. Each of these injection wells (intervals) will receive approximately 685 gal of amendment Injection will be conducted at rates of 1.5 gpm-2.0 gpm and pressures at the well head of 5 psig. For injection in Arrays Y and Z three injection setups will be required. The total time for each injection event on this Array is approximately 33 hours. One injection is planned for the first year of the program. The need for additional injection in this area will be determined from the results of the performance groundwater monitoring.

8.8.4 Amendment Mixing and Delivery System

The injection process for Array U and V will be conducted from the mixing and staging area established in Treatment Zone C. For injection in Arrays W,X,Y and Z AMEC will cordon off a 35 ft. by 35 ft. area in Treatment Area D as show in Figure 8.15 for material and equipment storage. Orange barricade fencing will be used to cordon off the material and equipment staging area. Potable water for mixing will be piped to the equipment area via 1.5 in. fire hose from the fire hydrant located in Treatment Area B.

During warmer weather, ABC totes that are not in immediate use may be stored adjacent to the material and equipment storage area and covered by a tarp. Staging area storage of Product ABC will be limited to 2 to 4 totes. If injection operations are conducted during cold weather (temperatures of less than 35 F) substrate will be stored within a heated building or enclosure before use.

Figure 8-10 previously presented the process equipment and the process flow diagram for material mixing. The material mixing process will consist of two 1,700-gallon, high density polyethylene (HDPE) tanks, transfer and mixing pumps injection pump, flow and pressure instrumentation and control valves. The mixing and injection process for the upper, intermediate and lower interval wells was previously described in Section 8.5.4.

8.8.5 Injection Monitoring

Injection rates and pressures will be monitored and recorded from the flow and pressure indicating elements on the control board at regular intervals during injection. Injection pressure will also be measured at the pump discharge before beginning injection and at several intervals during the operation.

Post injection monitoring will be performed at wells MW-25, MW-26, MW-16, MW-17, ZVI-2, and newly installed monitoring well OW-5. Additional monitoring well OW-5 will be a nested well. Details concerning the installation of well nest OW-5 are provided in Section 8.9. The frequency of monitoring and parameters are described in Section 11.

8.9 General Injection Sequence

The injection program will begin with injection of ABC+ in the source zone behind the plant and ERD injections in Treatment Zone A. The injection sequence for ABC+ injections in the source zone was specified in Section 8.2. The initial set of injections in Treatment Zone A will be conducted on Arrays J and N followed by injection on Arrays K and M. The final injections in Treatment Zone A will be on Arrays I and L.

Injections will be performed for the source area behind the plant following ABC+ injections in the source zone and ERD injections in Treatment Zone A. The source area injections may be conducted in a sequential manner. Concurrent with or following that activity, injections will be completed in Treatment Zone D. The initial Treatment Zone D injections should be conducted on Arrays U (high fatty acid ABC) and W (ABC-ole). Upon completion of those Arrays, injections should be conducted on Arrays V and X. Arrays Y and Z will be the final set of injections in Treatment Zone D.

After completion of Treatment Zone D, injections should be completed in Treatment Zones B and C following the general pattern described for Treatment Zone A.

The final set of injections in the initial round of treatment will be performed beneath the plant. The general sequence for these injections is Array C and H followed by Arrays D and F. The final injections arrays beneath the plant will be Arrays E and G.

The intent of the above injection sequence is to complete treatment at the source area and downgradient edge of the treatment zone during the first season prior to the beginning of winter which will require that injection activities are moved to within the plant. If schedule delays or weather necessitate a change in the above sequence, the Source Area ABC + injections and Treatment Zone D injections should be the priority areas and attempt to be completed prior to winter. Under these circumstances, ERD injections behind the plant and in Treatment Zone A would be conducted the following spring prior to completing injections in Treatment Zones B and C. Certain Treatment Zones are anticipated to receive multiple injections events. The sequence for the injection events following the initial round of treatment will be determined based on performance monitoring results.

8.10 Down-Gradient Groundwater Monitoring Wells

8.10.1 Monitoring Well Installation

In order to monitor remedial effectiveness in down-gradient Treatment Areas A to D, an additional five (5) monitoring wells will be added to the monitoring well network. The location of the additional monitoring wells (OW-1 through OW-5) is presented in Figure 8.19, and construction details are presented in Table 8.3.

Borings for monitoring well installation will be advanced using a suitable drill rig with either hollow-stem auger (HSA) drilling methods or rotosonic methods. For HSA methods, a nominal 10.25-inch outside diameter (OD) X 6.25-inch inside diameter (ID) borehole will be advanced from the ground surface to a given depth based on the pre-determined elevation for the well screen. The required depth of the boring was determined based on an estimated ground surface elevation compared to the pre-determined well bottom elevation (Table 8.3). During the field effort, soil samples will be collected from each borehole in continuous intervals using a standard split spoon sampler, or equivalent device, depending on field conditions. Standard penetration test N values will be recorded at each sample point. Retrieved soil samples will be visually examined to assess subsurface conditions and physical properties of the strata. These properties include: color, moisture content, and visual evidence of discoloration. Additionally, all soil samples will be field screened for evidence of volatile organic vapors via conventional headspace analysis techniques using a photoionization detector equipped with a 10.0 eV lamp. New monitoring wells will be installed prior to beginning installation of injection wells in the downgradient Treatment Zones A-D to provide additional litholgic data to allow final placement of the injection well screens.

At this site heaving sands can be problematic. Therefore, a bottom plug may be used in the bottom of the HSA string. It may be necessary to over-drill the borehole in anticipation of material entering the augers during removal of the bottom plug. Normally, 1 to 2 feet is sufficient for over-drilling. Clean water will be poured into the augers to equalize the pressure so that the inflow of formation materials and water will be held to a minimum when removing the bottom plug. The bottom plug (composed of either wood or PVC) should be knocked out of the bottom of the augers using 2-inch (AW) steel rods.

Each borehole will have a nested well pair installed at the appropriate depths. The wells will consist of 2-inch diameter, Type II, Schedule 40 PVC. Generally, the shallow wells will be constructed from threaded and gasketed casing, with a 5-foot, threaded, 0.010-inch slot well screen and threaded end cap. Deep wells will have a 10-foot 0.010-inch slot well screen. Specific well construction details are in Table 8.3. The wells will be set through the augers at each location per Indiana Department of Environmental Management Drilling Procedures and Monitoring Well Construction Guidelines (Policy # WASTE-053-NPD) and Indiana Rule 312 IAC 13-8-3 Requirements for Monitoring Well Construction.

Before the well screen and casings are placed on the bottom of the borehole, at least 12 inches of filter material should be placed at the bottom of the borehole to serve as a firm footing. The string of well screen and casings should then be placed into the borehole and plumbed. The filter pack material will consist of a clean, rounded to well-rounded, quartz silica sand of 20/40 sieve size (i.e., between 1/20 and 1/40 inch in size). Field sieve analysis indicated a median grain size of approximately 0.024 inches.

The augers should be slowly extracted as the filter pack is tremied into place using a 1-inch PVC tremie pipe lowered between the screen/casing and the augers. The gradual extraction of the augers allows the materials being placed in the augers to flow out of the bottom of the augers into the minimum 10-inch borehole. The filter pack will be extended a minimum of 1 foot and a maximum of 2-feet above the top of the well screen.

Shallow wells will have a bentonite seal of a minimum 1-foot vertical thickness but no more than 2-foot thickness, consisting of medium grade crushed (1/4 to 3/8-inch) bentonite, placed above the sand pack and hydrated with clean water. The deeper wells will have a bentonite seal of a minimum of one foot vertical thickness up to one foot below the bottom of the shallow interval well. Following seal hydration (minimum 2 hours), the remaining annulus will be filled with a 95/5 ratio neat cement grout. The neat cement grout should consist of a mixture of ninety-four (94) pounds of cement and no more than six (6) gallons of clean water. Bentonite will not exceed 5% of the total mixture. The grout will be installed in a manner to prevent bridging of the annulus between the outside of the well casing and the borehole from the top of the bentonite seal to within 3 feet of ground surface. The grout will be allowed to cure for a minimum of 24 hours before the concrete pad and surface casing are installed.

Each monitoring well will be completed at the surface with: a locking expansion cap set into the top of the 2-inch PVC casing; a 2-foot square, 6-inch thick concrete pad; and a rain tight flush mount protective cover. The top 3 feet of the well annulus will be filled with a concrete slurry consisting of approximately 25% sand and 75% Portland cement, with the flush mount protective cover installed in the concrete. Construction details are provided in Figure 8.20 and Table 8.3.

Upon completion of the drilling program, each monitoring well will be surveyed to establish horizontal locations. Additionally, the top of well casing elevation for each groundwater monitoring well will be established by survey.

8.10.2 Monitoring Well Development

At least 24 hours after the installation of the outer protective surface casing and completion of the concrete pad, the monitoring wells will be developed. Monitoring well development will be conducted to remove well drilling fluids, solids, or other particulates which may have been introduced or deposited on the boring wall in a recently installed well during drilling and construction activities. Development will be performed by using a surge block and a submersible pump to remove a minimum of five well casing volumes of water. Development will be complete when the water runs clear and three successive readings (taken at five-minute intervals) of pH, temperature, turbidity, and specific conductivity are stable. The development water will be transported in a tank designated for IDW and stored in the IDW staging area.

8.10.3 Decontamination

Drilling equipment (e.g., HSA, AW rods, tools) will be decontaminated between drilling each hole at a designated decontamination pad. Decontamination of equipment will consist of dislodging any loose dirt and subsequently using high pressure hot water or steam to wash the item thoroughly.

9.0 REMEDIATION DESIGN OF SUB-SLAB DEPRESSURIZATION SYSTEM

The primary design criterion for the SSD system is to maintain a sufficient negative vacuum beneath the slab in the area of the source treatment zone. A design goal of at least 0.004 inches of vacuum influence beneath the sub slab was established for this project. Guidance used in establishing this value was the New Jersey Department of Environmental Protection, Site Remediation Program's "Vapor Intrusion Technical Guidance", dated March 2013.

Based on differential pressure data collected during pilot testing, positive pressure conditions exist beneath the sub-slab within the source area treatment zone. Considering that positive pressure background readings exist beneath the slab, these pressures need to be included in the design. The maximum background pressure recorded from the vapor probes prior to the pilot test was 0.054 inches water column (WC). This was the background pressure used for designing the SSD system. Table 6-7, presents the background pressures measured on December 18, 2012. During pilot vapor test extractions, the sub-slab vacuum resistance at the extraction well heads ranged between 11 and 40 inches of WC at flows at flows from 10-120 scfm. The ideal vacuum level was determined to be approximately 11 inches WC. Based on the ROI data presented in Appendix K for each test where the "Y" value was set at 0.058 inches WC, an effective ROI to achieve the design vacuum goal of 0.004 inches WC ranged from 41 feet to 62 feet. As a safety factor, an ROI of 41 feet was selected for the design. Utilizing a design ROI of 45 feet, AMEC recommends installing six extraction wells at strategic locations within the Plant and the source area treatment zone. Figure 9-1 presents the proposed locations of the six wells. At four of the six well locations, a 41 foot ROI is shown.

No ROI is shown for two (locations H19 and H21) of the six proposed wells situated along the western side of the Plant. The radii at these locations will be restricted by the exterior wall footer and by the interior wall footer to some degree. The interior wall footer to the west was observed during the footer assessment activities and based on the observation, AMEC concludes that it extends deeper than 20 inches bgs. Based on the results of the June 2013 sub-slab communication test, it appears that the interior wall footer does not provide a continuous barrier between the interior portions of the facility. AMEC did not assess the depth of the exterior wall footer, however assumes that it extends below the frost line of approximately 3 feet bgs.

9.1 Emissions/Permitting

Anticipated emissions for the SSD system are presented on Table 6-8. Based on the predicted design flow and the results of the December 18, 2012 vapor sample results, hazardous air pollutants (HAPs) to be emitted are less than permit thresholds. As such, no treatment is recommended for this air source.

The Plant is currently permitted to perform operations under a "Registration Status" with the IDEM Air Department. As such, the additional emissions from the SSD system are subject to these regulations. AMEC, with assistance from Acument, plans to modify the current permit to include the SSD system emissions.

Based on the low-level detection of HAPs and other VOCs in the December 18, 2012 vapor sample, the addition of the SSD system should not change the Plant's "Registration Status" as the potential to emit will remain less than 30 tons VOCs per year.

9.2 Extraction Well Installation

Six extraction wells are proposed for the SSD system. Extraction well design will be similar to the temporary construction of the vapor extraction wells that were utilized in June 2013. Figure 9-2 presents a plan view of the proposed extraction piping, wells and blower. Details of the extraction well design are presented on Figure 9-3. (Appendix A). Figures 9-4 and 9-5 show this detail along various columns and wall footers. Any modifications to this design will be noted during the extraction well installation. Modifications are not anticipated and will not be performed unless below ground site conditions differ than previously observed.

9.3 Extraction Piping

The extraction piping specified for this project will consist of various sizes of PVC. Pipe size will range between four and eight inches (nominal). Pipe and fitting sizes larger than 4 inch will be constructed of cellular core PVC material to reduce weight. Piping of 4 inch diameter will be constructed of Schedule 40 PVC material. To minimize disruptions to Plant operations, the piping will be routed above ground utilizing interior roof I-beam supports. The common header pipe from the blower will be 8 inches in diameter. Six-inch PVC piping will be used for branches from the header to the wells. At each extraction well location, a dedicated 4 inch diameter PVC pipe will connect each well to extracting piping. Each dedicated 4 inch PVC pipe will include a flow control valve, a 3/8-inch pipe port for monitoring vacuum and a 3/8-inch pipe port for monitoring flow for system balancing, if needed. The common 8 inch diameter extraction pipe will be routed through the roof and attached to the Blower. Blower details are provided in the next section. Figure 9-2 presents a plan view of the proposed extraction piping, wells and blower. At pipe size transitions, four cross-sections were developed to present the transition detail. These cross-sections are shown on Figures 9-4 through 9-7 in Appendix A.

9.4 SSD Blower System

Radon blower systems were elevated for the Site using one or multiple blowers in order to achieve design goals. However, based on the design flow and vacuum required to achieve designed goals, AMEC recommends using one radial blower manufactured by the Cincinnati Fan Company.

9.4.1 Blower specifications

A 3 horsepower radial blower, model PB-15A was recommended for the SSD system. This blower is rated for 600 acfm at 15 inches water column and will be equipped with a variable frequency drive (VFD) in order to regulate flow and minor adjustments to vacuum. Vacuum output for this blower is approximately 15 inches of WC, 4 inches greater than the 11 inches WC to accommodate for minor friction loss associated with long pipe runs. Figure 9-2 presents the approximate location for the proposed roof-mounted blower system. Figure 9-6 presents a cross-section view of the blower system and immediate ancillary piping. Manufacturer blower specifications and performance curve is presented in Appendix M.

9.4.2 Monitoring and Control Equipment

PLC and Telemetry Station

The SSD system will be controlled by a programmable logic controller (PLC). The control equipment will include a VFD with multiple set points, a pressure transmitter for monitoring vacuum and a flow transmitter for monitoring flow at the blower location. Remote on/off control of the system and multiple frequency set points for the blower operation will be accomplished using a wireless telemetry station. In addition to the telemetry controls, the telemetry system will enable remote monitoring of system flow and vacuum.

Vacuum sensors

The SSD system will be equipped with a vacuum sensor located at the blower. This sensor will enable remote monitoring of the blower vacuum thus providing key information on blower status.

Flow sensors

A flow sensor and transmitter will be installed near the blower to monitor system flow rate.

9.5 SSD System Communication Testing and Monitoring

SSD communication testing and monitoring will be performed during start-up and during scheduled visits. Scheduled visits will be performed every 90 days during injections and post injection monitoring.

Each of the six existing vapor probes (VP-1 through VP-6) will be measured during start-up and once per quarter for pressure. The results of the pressure readings will be recorded in the field notes.

If during any measurements vapor probes VP-5, VP-6, and VP-7, which are within a 41 foot ROI, do not exhibit a negative reading; the SSD system will require balancing using one or more of the six flow control valves. If balancing is not enough to sustain a negative vacuum reading at all of these points, system modification (i.e. additional extraction wells) may be necessary. Balancing will also be performed during each O&M visit to ensure the SSD system maintains negative vacuum levels beneath the slab within the source area treatment zone. Indicators of negative vacuum beneath the slab will be vapor probes VP-1 through VP-7 with special attention to probes VP-5, VP-6, and VP-7 that fall within the desired ROI.

9.6 Indoor Air Sampling

Approximately 30 days after SSD start-up, indoor air samples will be collected adjacent to vapor probe locations VP-1 and VP-6, which historically, exhibited the greatest concentrations of vapors tested from vapor probes VP-1 through VP-7. Collection of an indoor air sample at this location will be performed in accordance with the IDEM's "Vapor Remedy Selection and Implementation" Guidance, dated February 2014. If the 30-day indoor air sampling event falls outside of worst-case conditions "winter", a subsequent indoor air sampling event will be collected at this location during worst case conditions. The results of the indoor air sampling will be limited to TCE and its daughter products, and will be compared to indoor air thresholds. Areas where indoor air exceeds these thresholds will be evaluated for additional SSD applications or modifications. If the results of the indoor air sampling document the success of the SSD system, subsequent testing will be limited to communication monitoring.

10.0 HEALTH AND SAFETY PLAN DEVELOPMENT

Prior to mobilizing to the Site to perform remedial activities, AMEC will prepare a Site-specific health and safety plan to govern our activities. We have assumed that Level D personnel protective equipment (PPE) will be appropriate for all field work. In addition, AMEC will contact Indiana 811 and request that member utilities mark their lines in the vicinity of the proposed injection areas.

11.0 GROUNDWATER MONITORING PLAN

There are three components to the groundwater monitoring plan proposed for the Site. The first component addresses performance monitoring of the remediation, the second component will evaluate the plume stability after completion of the remedial activities, and the third will be annual groundwater monitoring to document the plume boundaries.

A performance groundwater monitoring program will be implemented at the Site to obtain adequate data to assess short-term remedy performance. The performance groundwater monitoring program will provide critical Site data that will guide and help balance future injections of biostimulant or ISCR amendments. Stability monitoring will be performed to evaluate the long term effectiveness of the remedy in meeting RAOs. The stability of the VOC plume will be used as the remediation end point and a basis of a conditional environmental closure for the Site.

The objectives of the groundwater monitoring program are to:

- Collect remedial performance monitoring groundwater samples from designated wells quarterly;
- Collect plume stability groundwater samples (beginning one year following the completion of remedial injections) from designated wells during eight sampling periods over 2 years;
- Determine field water quality parameters [e.g., pH, oxidation-reduction potential (ORP), dissolved oxygen (DO)];
- Analyze the samples for VOCs, anions (nitrate, chloride and sulfate), total organic carbon (TOC), alkalinity, DHC, dissolved gases (methane, ethane and ethene), VFAs and select metals (arsenic, selenium, iron and manganese) as appropriate;
- Compile and evaluate analytical results; and
- Report the analysis results to Textron and IDEM.

The objectives of the groundwater monitoring plan are to:

- Define the basis and monitoring scope for evaluating the performance of the ERD and ISCR remediation; and
- Identify the specific monitoring wells and approach that will be utilized to determine groundwater plume stability once active remediation has ceased at the Site.

Field activities to be performed during groundwater monitoring will follow the QAPP presented in Appendix N for groundwater data collection, sampling, and analyses.

11.1 Remediation Performance Groundwater Monitoring

Periodic remediation performance monitoring will be conducted at the Site to assess contaminant concentrations and transformation, the distribution of the remedial amendments and groundwater geochemistry within the Treatment Zones. As previously discussed in this RWP, the Treatment Zones consist of the Source Area west (behind) the Plant, the Source Area beneath the Plant, and Treatment Zones A, B, C and D (east of the Plant). Figure 8.1 presents the Treatment Areas.

A total of 43 monitoring wells have been selected for performance monitoring. Performance monitoring wells will include wells that are within the treatment zones shown on Figure 8.1 and wells located near the treatment zones. The list of wells to be sampled along with the parameters is presented on Table 11-1 (Appendix B). Also included in Table 11-1 are the parameters that will be measured in the field and in the laboratory. These parameters are the same as presented in Section 6.2 of this RWP and in Table 6.1 through Table 6.5.

The frequency of groundwater sample collection from the performance monitoring wells is once per calendar quarter. The complete set of performance monitoring parameters will not be analyzed from all of the wells each calendar quarter. The frequency and parameter selection may change for certain wells based on analytical results and trend analyses.

Performance groundwater monitoring for each treatment zone will be discontinued approximately one year following final injections.

11.2 Plume Stability Assessment Monitoring

Plume stability assessment will begin following the completion of the remedial injections and remediation performance monitoring. The plume stability assessment will be used to evaluate long-term remedy effectiveness in achieving RAOs. Objectives include: demonstration that contaminant concentrations are stable or declining at the messenger wells and perimeter of compliance wells; demonstration that average contaminant concentrations and average contaminant mass within a treatment area has been reduced; and demonstration that concentrations in down-gradient well (MW-30) are stable or declining and that individual contaminant concentration fluctuations do not indicate instability above a spatial mean. Plume stability analysis will be performed using a variety of qualitative, statistical and graphical methods.

Plume stability monitoring will include a minimum of eight consecutive quarters of data from select wells. Wells to be included in the stability monitoring program will include: messenger wells, perimeter of compliance wells, and a down-gradient well. Table 11-2 (Appendix B) presents the list of 10 wells to be sampled for plume stability monitoring.

Data collected both from this phase of groundwater monitoring and the remedial performance groundwater monitoring will be combined and utilized in the assessment of plume stability. For this RWP plume stability is defined as a condition where the plume is no longer expanding in size, and the plume footprint is not moving. Qualitative methods within each treatment area to be used to determine plume stability include: average concentration versus time plots, average concentration versus distance plots and concentration isopleth maps.

Individual well statistical methods will be performed on the monitoring wells listed in Table 11-2. The statistical analysis will include linear regression analysis and Mann Kendall analysis. To ensure a meaningful comparison of contaminant concentrations over time the groundwater monitoring data for each well should include at least four measured concentrations over six sampling events. The Mann-Kendall test is a non-parametric statistical procedure that is well suited for analyzing trends in data over time. The Mann-Kendall test does not require any assumptions as to the statistical distribution of the data (e.g. normal, lognormal, etc.) and can be used with data sets which include irregular sampling intervals and missing data. The Mann-Kendall test is designed for analyzing a single groundwater constituent, multiple constituents are analyzed separately. Data reported as less than the detection limit are assigned a value of ½ the detection limit. The Mann-Kendall test is expected to be less affected by outliers because its statistic is based on the sign of differences, not directly on the values of the random variable. However, the non-parametric nature of this method means the overall magnitude of the change in concentration is not considered directly in the calculations. Concentration trends are classified in the six categories outlined below:

- Increasing trend – Mann Kendall statistic greater than 0 with a greater than or equal to 95% (one-tailed) confidence level (i.e., a significance level of 0.05).
- Probably increasing trend – Mann Kendall statistic greater than 0 with a confidence level greater than 90%, but less than 95%.
- Decreasing trend – Mann Kendall statistic less than 0 with a greater than or equal to 95% confidence level.

- Probably decreasing trend – Mann Kendall statistic less than 0 with a confidence level greater than 90%, but less than 95%.
- No trend – Mann Kendall statistic greater than 0 with a confidence level less than 90%, or Mann Kendall statistic less than 0, the confidence level less than 90%, and the coefficient of variation greater than 1.
- Stable trend – Mann Kendall statistic less than 0 with a confidence level less than 90% and the coefficient of variation less than 1.

Linear regression is a parametric statistical procedure that is typically used for analyzing trends in data over time. The parametric test considers the linear regression of the random variable (Y) on time (X). The regression coefficient is computed from the data. The linear regression calculation was chosen because the values of slope and intercept can be adjusted to find the line that best predicts Y from X. The linear regression analysis for trend detection is based on, and therefore checks only for, a linear trend.

If the linear regression and MK analysis do not agree then we will consider it to be no trend. In this case a whole plume evaluation method will be evaluated in regards to evidence of a shrinking plume. Isopleth maps will be prepared for each groundwater monitoring event so the plume can be evaluated over time. If a shrinking plume is observed, this will be considered to meet plume stability regardless of whether MK indicates an increasing trend.

The whole plume evaluation methods will include plume area and plume mass. Contaminant distribution isopleths will be developed for several sampling events and the characteristics mentioned above will be calculated for each event. A statistical trend analysis will be performed on the calculated values to assess temporal trends and demonstrate plume stability. Table 11-3 presents the monitoring wells that will be part of the whole plume evaluation. Groundwater samples will be collected from these wells on a semi-annual basis.

In addition to plume stability monitoring, VOCs will be compared to MCLs for POC and the down-gradient wells. Where VOCs exceed MCLs in one or more sampling event, AMEC will perform statistical analyses (i.e. 95% UCL) to evaluate plume stability. If after eight quarters of monitoring, stable plume conditions are inconclusive, additional monitoring will be conducted.

If the plume is no longer expanding in size, and the plume footprint is not moving after eight consecutive quarters of plume stability assessment monitoring, a “No Further Action” request as a “Conditional Closure” would be submitted to IDEM.

11.3 Annual Groundwater Monitoring

Annual groundwater monitoring will be conducted at the Site until a conditional closure is granted by IDEM. The annual groundwater monitoring will typically be performed during the second calendar quarter. For the annual groundwater sampling, 93 monitoring wells have been selected based on historic VOC concentrations and plume migration direction. The monitoring wells that are included in the annual groundwater monitoring list will be periodically assessed and the list will be revised based on observed data trends. The list of wells proposed for annual monitoring is presented in Table 11-4 (Appendix B). The annual monitoring event will be coordinated with a quarterly monitoring event in order to conserve resources.

12.0 WASTE MANAGEMENT

Waste generated at the Site will be managed by AMEC. General solid waste will be segregated from IDW. Solid waste consisting of spent materials (i.e. bailers, gloves, PPE, cardboard containers, etc.) will be disposed of using local sanitary waste companies. IDW from drilling, sampling, and injection activities will be contained in DOT approved containers and transported off-site for disposal or recycling. Heritage Environmental Services (Heritage) is the Textron approved licensed disposal facility for all IDW generated at the Site. Previous waste characterization at the project site has demonstrated that the waste is non-hazardous. Representative samples will be collected from the IDW that originates from drilling the injection wells in order to confirm that the soil does not exhibit any hazardous constituents.

12.1 Investigative Derived Waste

12.1.1 Soil

Soil generated from drilling activities will be contained in DOT approved 15 cubic yard (nominal) roll-off containers equipped with weather-proof tarps. Soil generated as IDW will be transported a licensed disposal facility. If additional characterization is required, AMEC will perform sampling to comply with Heritages waste profiling procedures. Roll-off containers, once full, will be transported by Heritage to their approved disposal facility.

Soil generated from excavating or grading for access or well pad installation will be stockpiled at the site and subsequently thin spread following completion of work activities.

12.1.2 Water

Purge water and development water pumped from the wells will be temporarily contained in polyethylene tanks until transferred to larger storage tanks for proper onsite storage and offsite disposal/recycling by Heritage.

12.2 Injection Materials

Water generated during injection activities will also be contained in the IDW storage tanks with any purge water for subsequent disposal/recycling by Heritage.

13.0 REMEDIATION SITE CLOSURE

13.1 Sub-Slab Depressurization

The SSD system will operate until a “Conditional Closure” is granted for the Site by IDEM. Once Textron receives a “Conditional Closure” from IDEM, the SSD system will be scheduled for removal.

13.2 Treatment Zones

Treatment zone wells will remain in place until a “Conditional Closure” is granted for the Site by IDEM. Once Textron receives a “Conditional Closure” from IDEM, the treatment zone wells will be scheduled for permanent sealing.

13.3 Groundwater Monitoring

Annual groundwater monitoring will continue until a “Conditional Closure” is granted for the Site by IDEM. Once Textron receives a “Conditional Closure” from IDEM, one or more of the wells in the monitoring well network will be scheduled for permanent sealing. Textron may elect to maintain monitoring well integrity in pursuing an “Unconditional Closure” in the future.

13.4 Engineering Controls

Municipal drinking water from the City of Rochester is piped approximately 5 miles to the Site and surrounding properties as an engineering control for the groundwater ingestion pathway. The South Richland Conservancy District was established to operate, and maintain, the water system. The district is responsible for day to day operations in maintaining the drinking water system which is comprised of a main extension line, hydrants, and a control building.

The municipal drinking water will remain a permanent control for the groundwater ingestion pathway (applicable to the Site release) until groundwater conditions beneath the site and at the surrounding properties meet regulatory standards established for drinking water.

13.5 Institutional Controls

The ERCs will remain in effect for all of the affected properties until groundwater conditions beneath the site and at the surrounding properties meet regulatory standards established for drinking water.

14.0 REFERENCES

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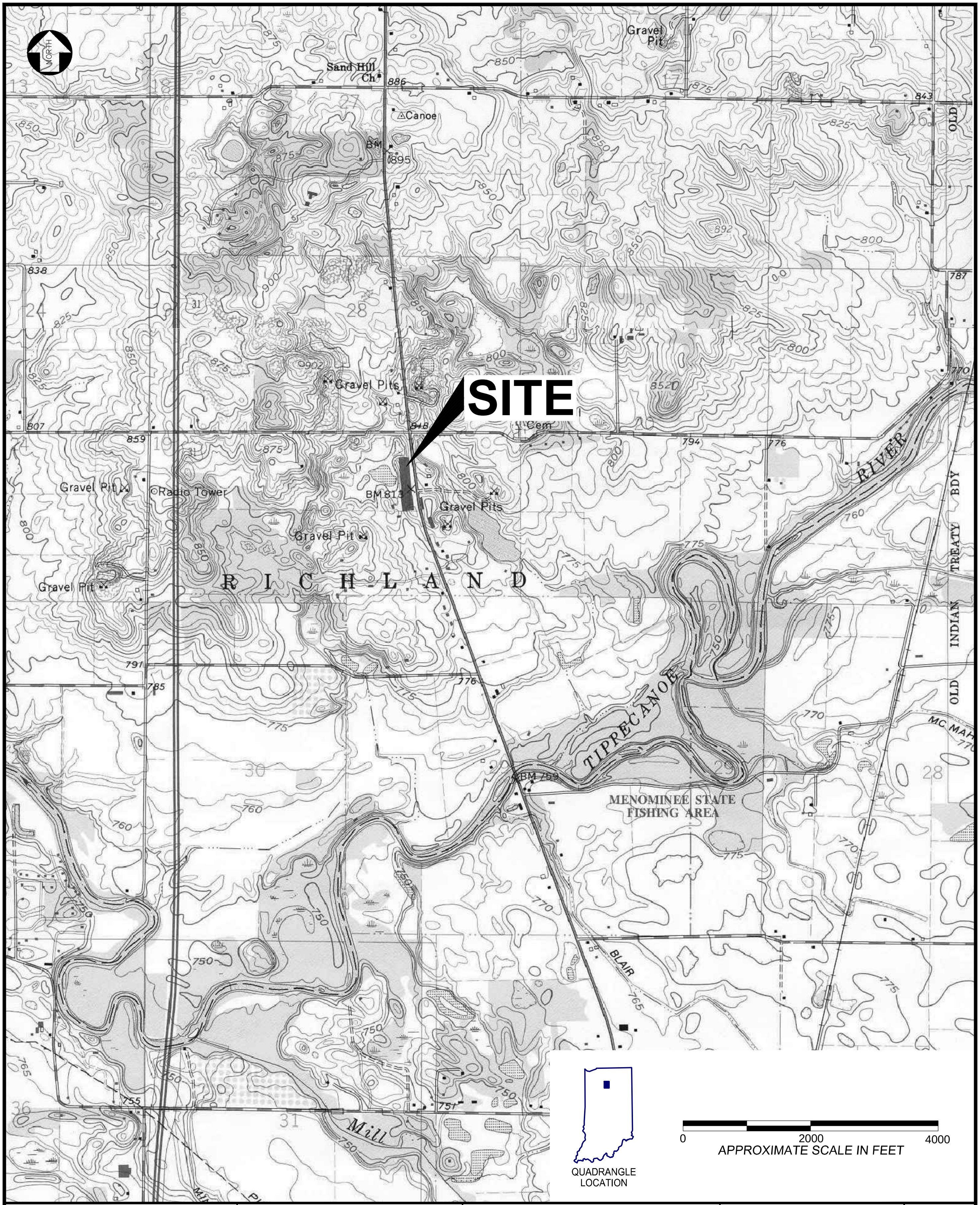
APPENDIX A

FIGURES



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APPROVED BY PJS	DATE June 2014
SOURCE USGS topographic quadrangles of Argos, IN, 1994 and Rochester, IN, 1992.	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

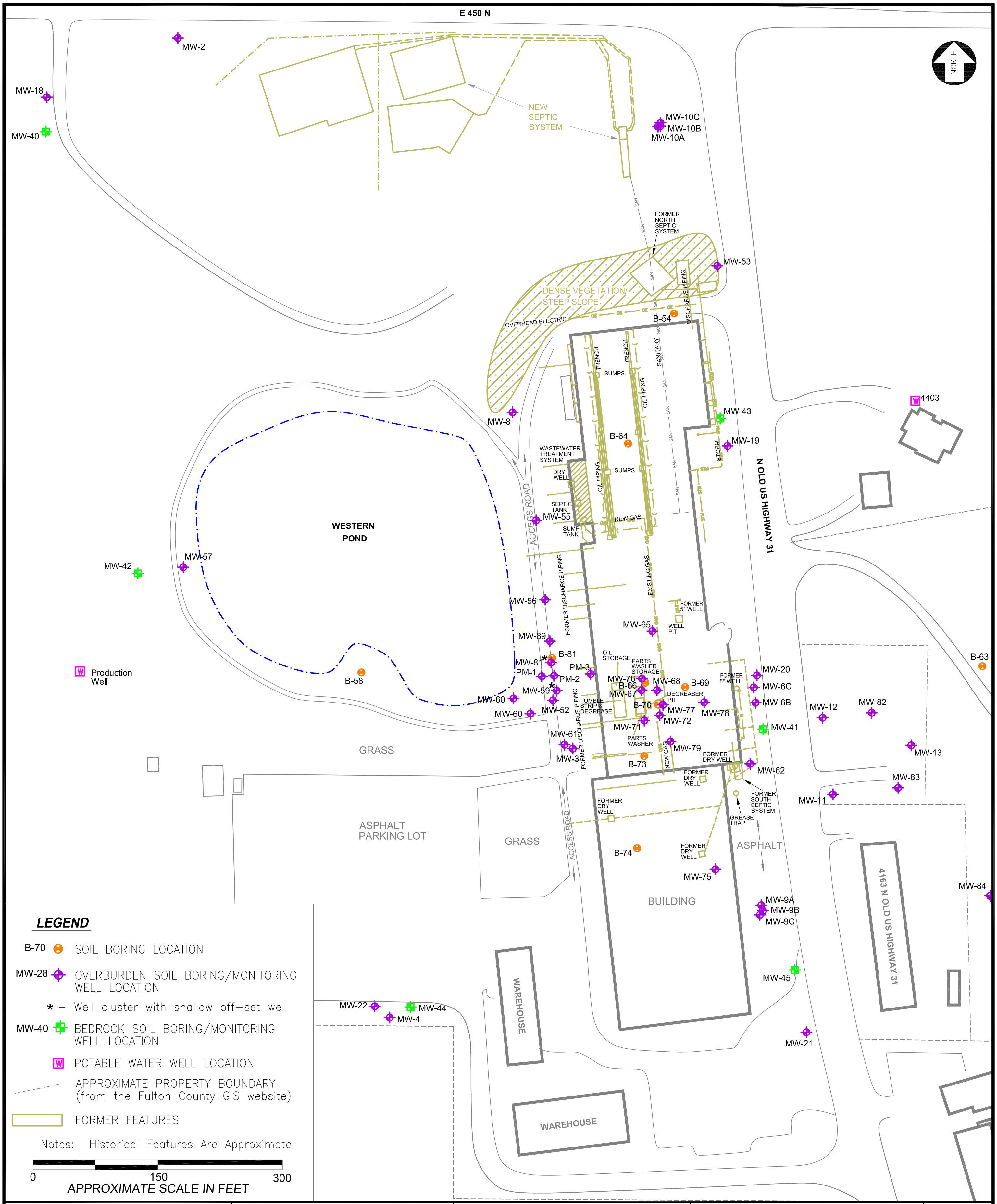
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

SITE LOCATION MAP

FIGURE
2-1

SHEET 1 of 1



LEGEND

B-70 ● SOIL BORING LOCATION

MW-28 ⌖ OVERBURDEN SOIL BORING/MONITORING WELL LOCATION

* – Well cluster with shallow off–set well

MW-40 ⊞ BEDROCK SOIL BORING/MONITORING WELL LOCATION

W POTABLE WATER WELL LOCATION

– – – APPROXIMATE PROPERTY BOUNDARY (from the Fulton County GIS website)

▭ FORMER FEATURES

Notes: Historical Features Are Approximate

0 150 300

APPROXIMATE SCALE IN FEET

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\TFS Site Features.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Wells surveyed by Territorial Engineering, 2009; Fulton County, IN GIS, 2005; historical maps from Textron	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

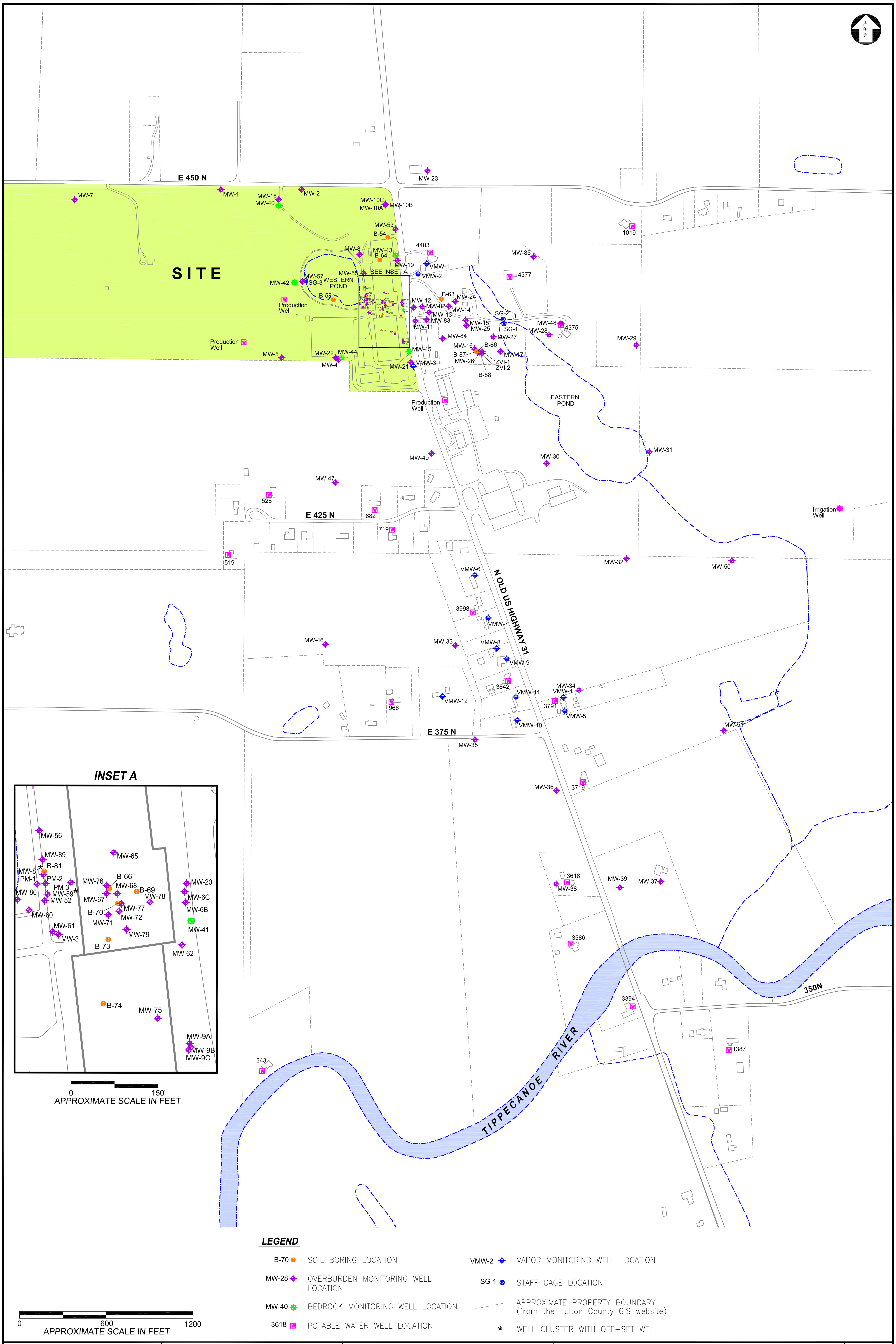
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

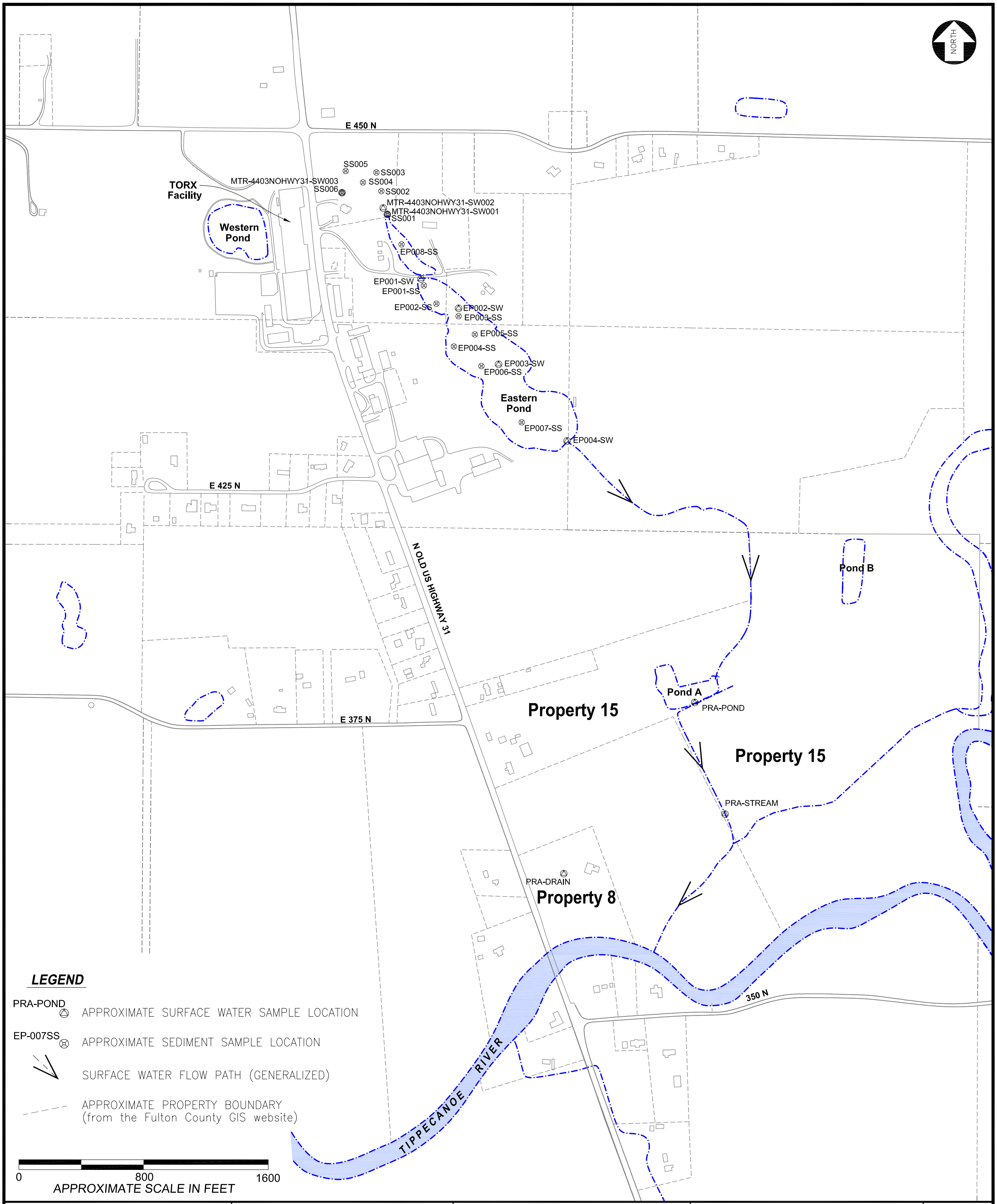
SITE FEATURES

FIGURE
2-2

SHEET 1 of 1



DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS Site Plan 2013 11x17.dwg	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	**SITE PLAN**	FIGURE **2-3**
APPROVED BY PJS DATE June 2014			
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.			
PROJECT NO. 3359 12 2618 SCALE SEE ABOVE			SHEET 1 of 1



DRAWN BY	FILE NO.
RLB	P:\Textron\TFS\ Drawings\TFS Risk Asmnt.dwg
APPROVED BY	DATE
PJS	June 2014

SOURCE Wells surveyed by Territorial Engineering, 2009; Fulton County, IN GIS, 2005.

PROJECT NO.	SCALE
3359 12 2618	SEE ABOVE

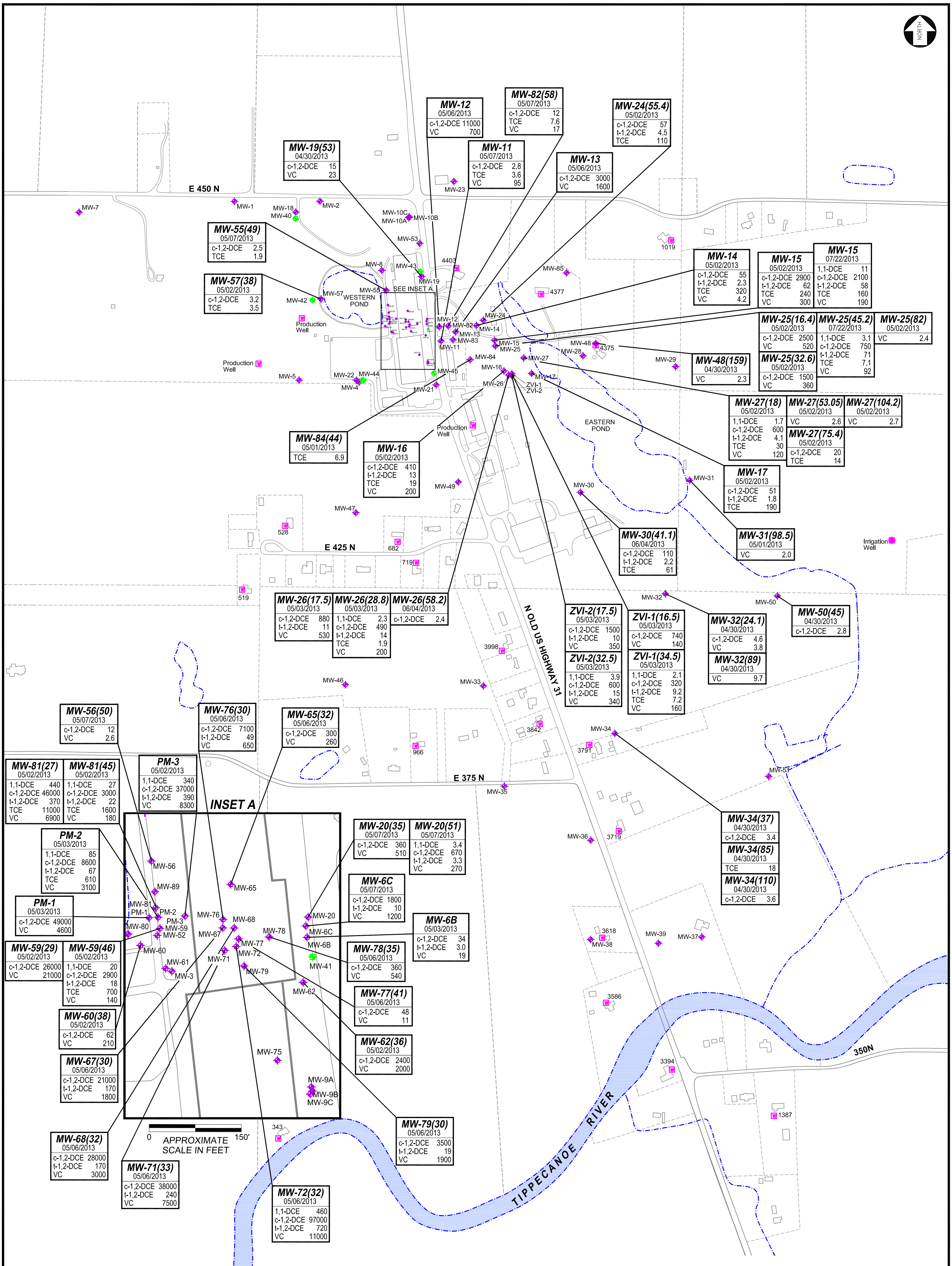
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

FIGURE
2-4

SHEET 1 of 1



0 600 1200
APPROXIMATE SCALE IN FEET

LEGEND

MW-28 ⌖ OVERBURDEN MONITORING WELL LOCATION

MW-40 ⊞ BEDROCK MONITORING WELL LOCATION

- - - APPROXIMATE PROPERTY BOUNDARY (from the Fulton County GIS website)

(53) BOTTOM OF SCREENED INTERVAL (feet below ground surface)

3618 W POTABLE WATER WELL LOCATION

MW-19 (53) 04/30/2013		SAMPLE IDENTIFICATION DATE SAMPLE COLLECTED
VC	23	COMPOUND NAME AND RESULT VALUE

NOTES:

Results reported in micrograms per liter (µg/L).

See laboratory report for complete list of analytes tested and detection limits.

J - Value is estimated.
1,1-DCE - 1,1-Dichloroethene
c-1,2-DCE - cis-1,2-Dichloroethene
t-1,2-DCE - trans-1,2-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\TFS Site Plan 2010 11x17.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

SPRING/SUMMER 2013 - SITE-RELATED VOC CONCENTRATIONS IN GROUNDWATER

FIGURE 2-5

SHEET 1 of 1

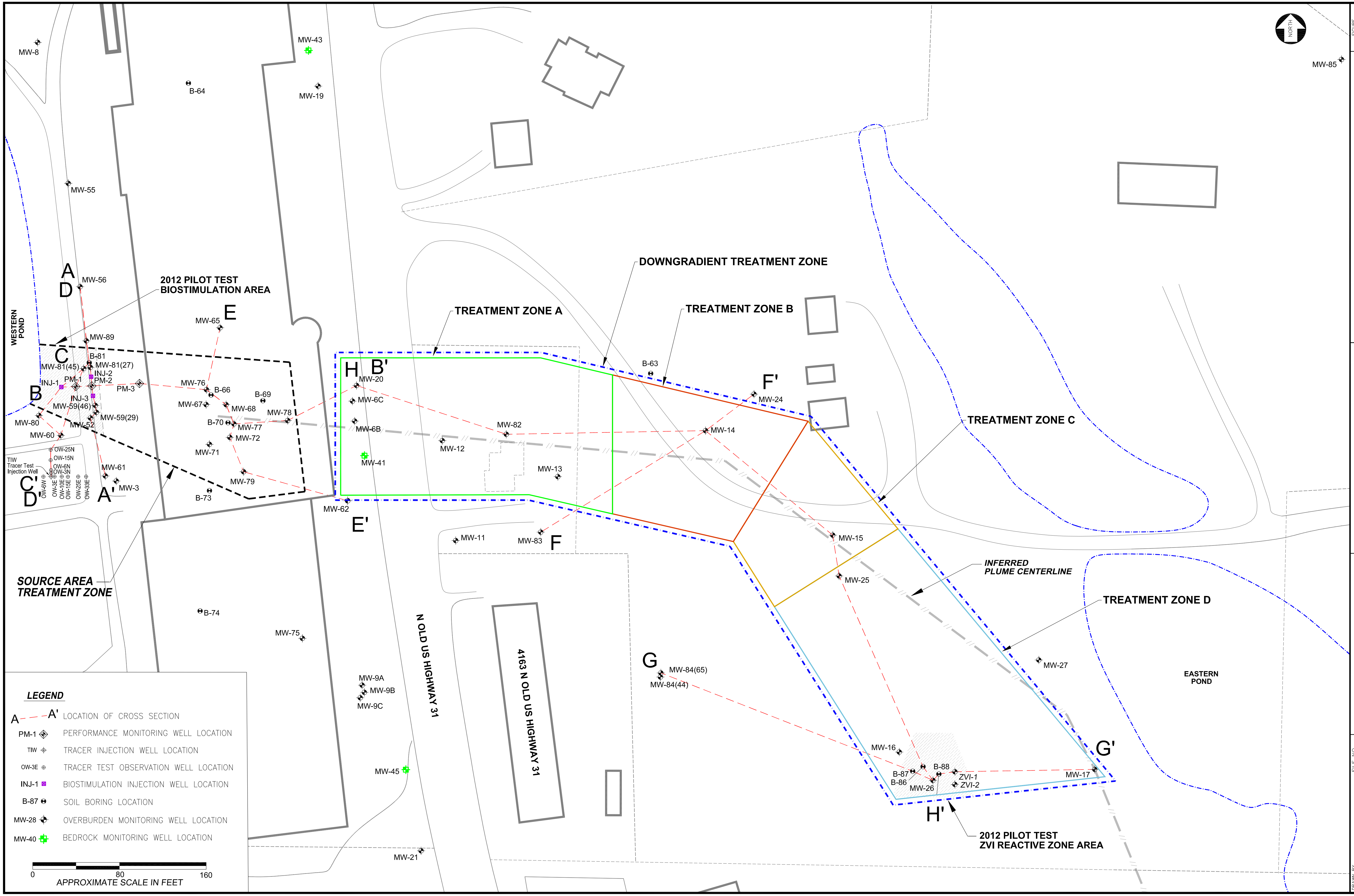


FIGURE
3-1

SHEET 1 of 1

PROPOSED TREATMENT AREAS AND LOCATION OF GEOLOGIC CROSS SECTIONS

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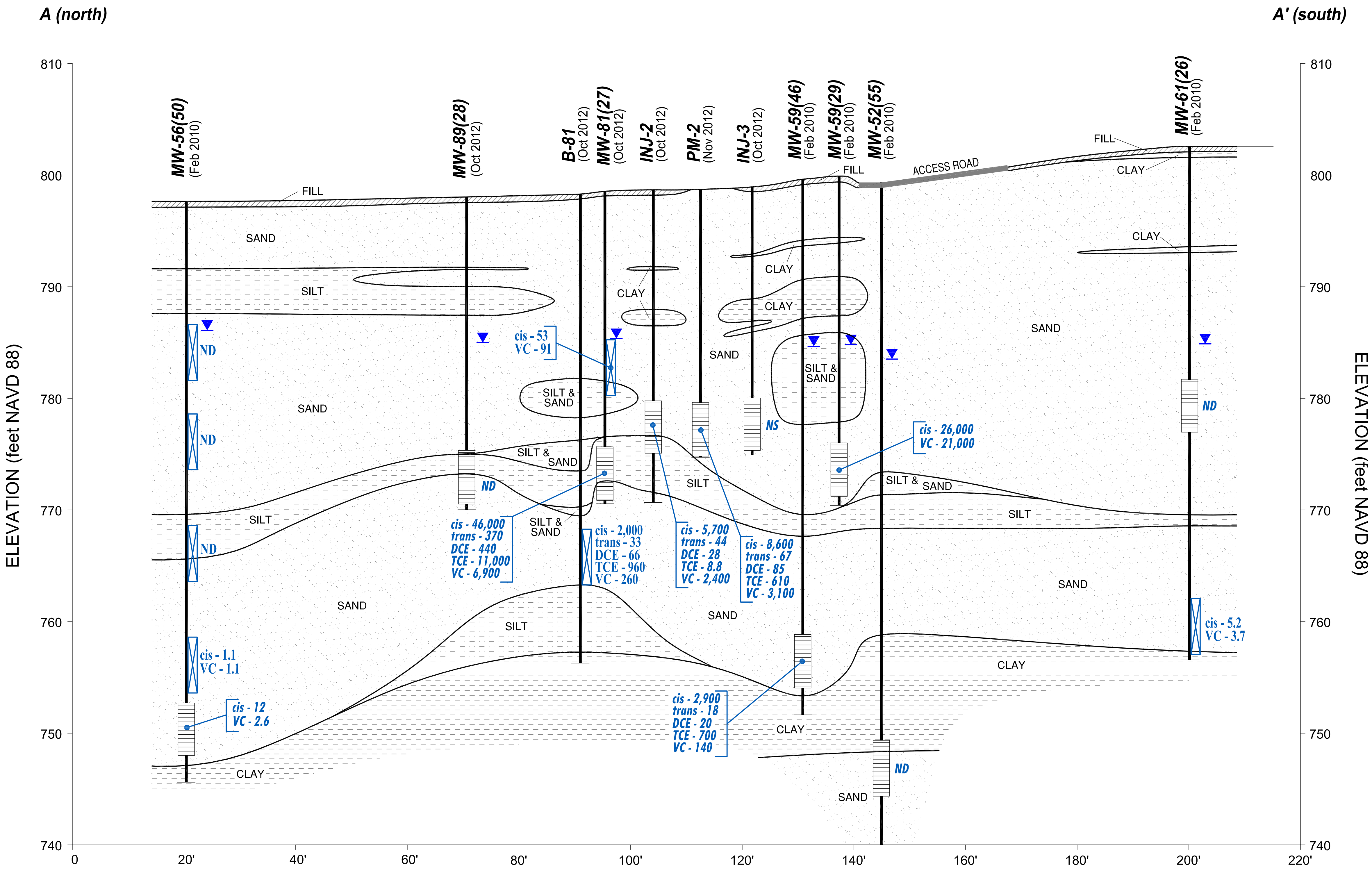
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\Pilot Test Areas 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Well Screen

↑ Observed Vertical Groundwater Gradient

MW-56 (Feb 2010) Well Location & Date Installed

VC - 11 Site-related VOCs Results from Spring 2013

cis - 5.2 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (μg/L)

ND - Site-related VOCs not detected greater than detection limits.

NS - Not sampled

J - Estimated value

NAVD 88 North American Vertical Datum 1988

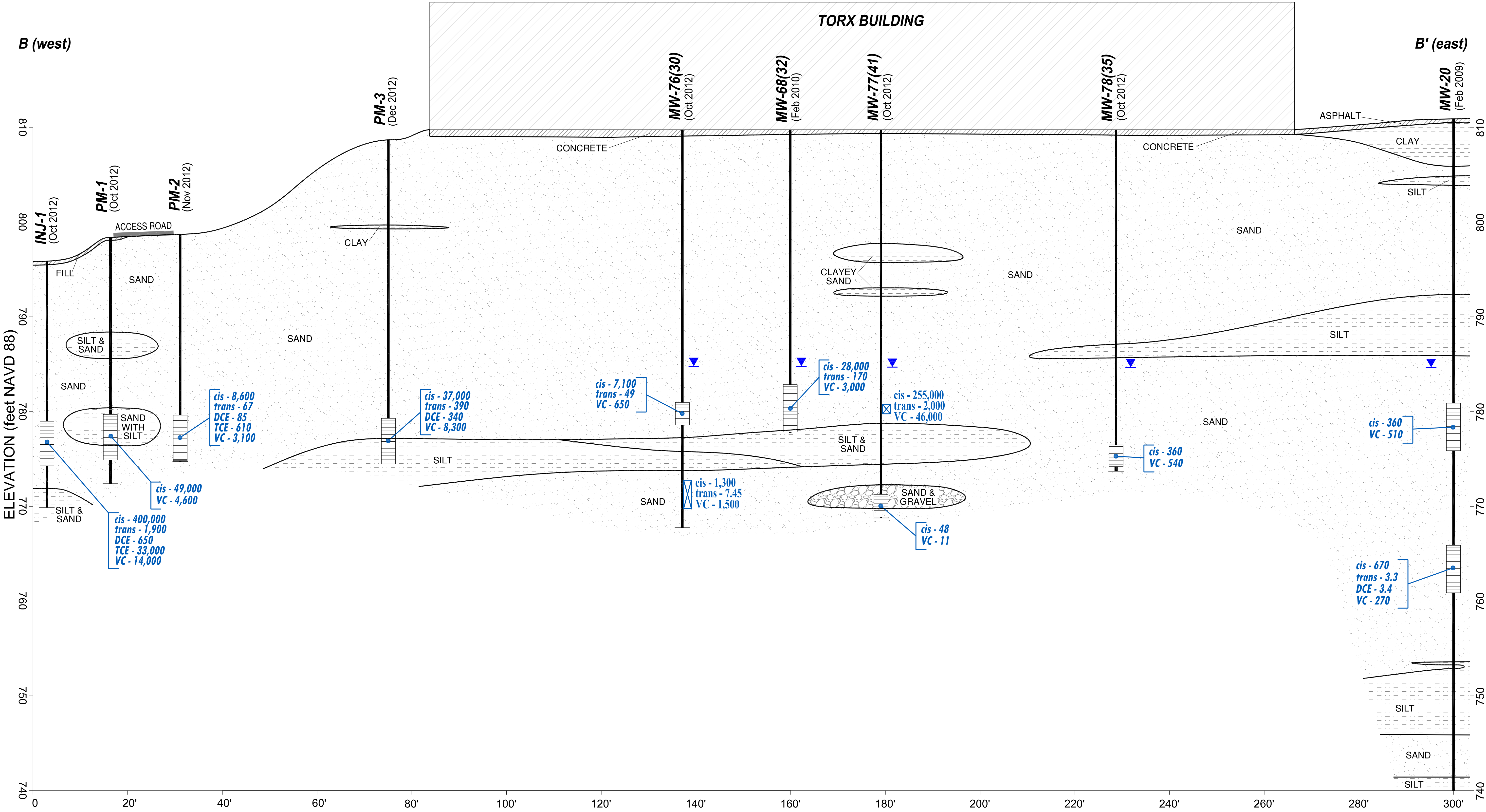
FIGURE
3-2
SHEET 1 of 1

GEOLOGIC
CROSS SECTION A-A'
NORTH to SOUTH

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\ TFS Sections Jan 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Well Screen

↑ Observed Vertical Groundwater Gradient

MW-76 (Oct 2012) Well Location & Date Installed

VC - 11 Site-related VOCs Results from Spring 2013

cis - 5.2 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dicloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (µg/L)
ND - Site-related VOCs not detected greater than detection limits.
J - Estimated value
NAVD 88 North American Vertical Datum 1988

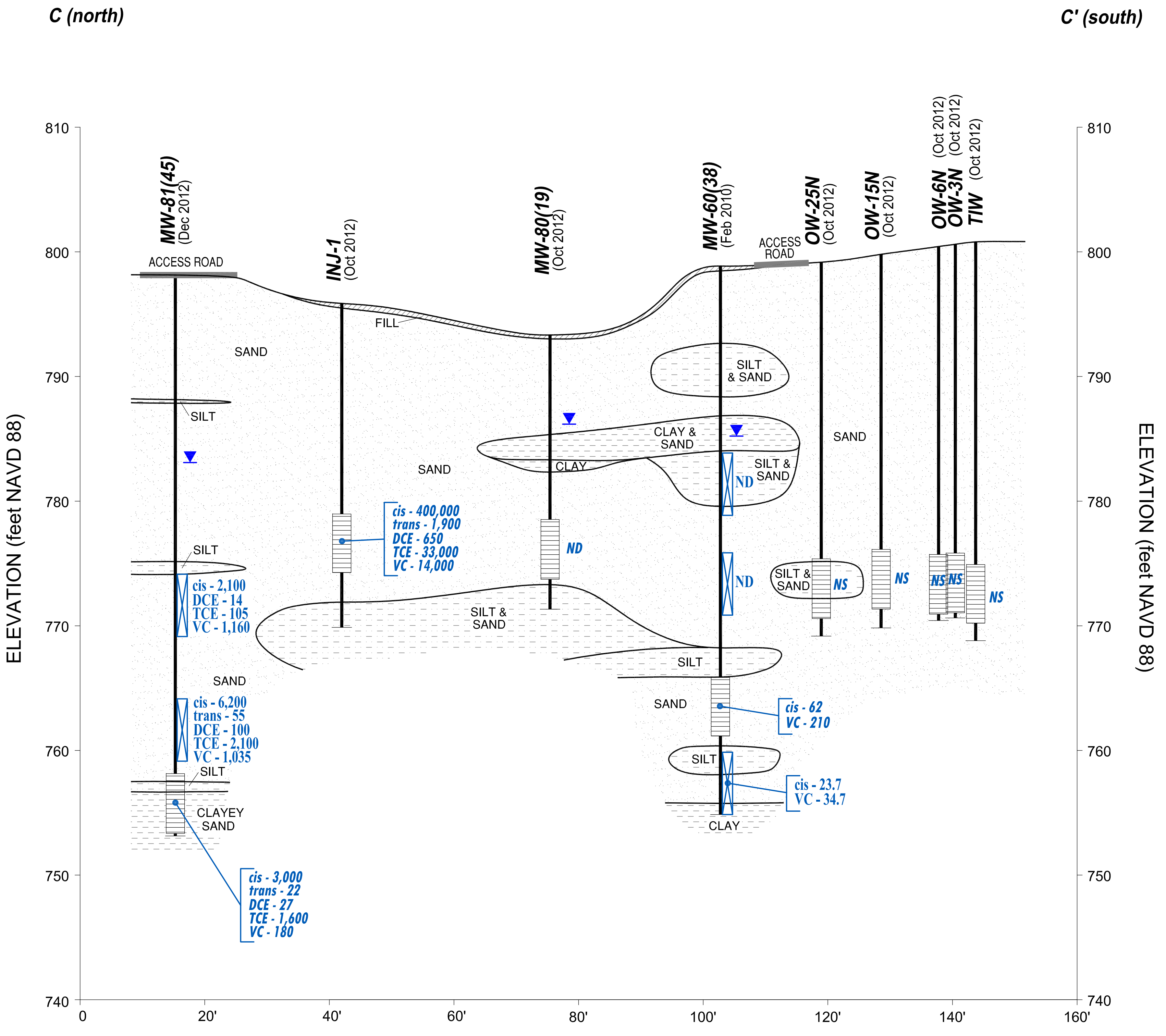
FIGURE
3-3
SHEET 1 of 1

GEOLOGIC
CROSS SECTION B-B'
WEST to EAST

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\TFS Sections Jan 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼	Depth to Water (April/May 2013)
▤	Well Screen
↑	Observed Vertical Groundwater Gradient
MW-81 (Dec 2012)	Well Location & Date Installed
VC - 11	Site-related VOCs Results from Spring 2013
cis - 5.2 ☒	Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (µg/L)
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
J - Estimated value
NAVD 88 North American Vertical Datum 1988

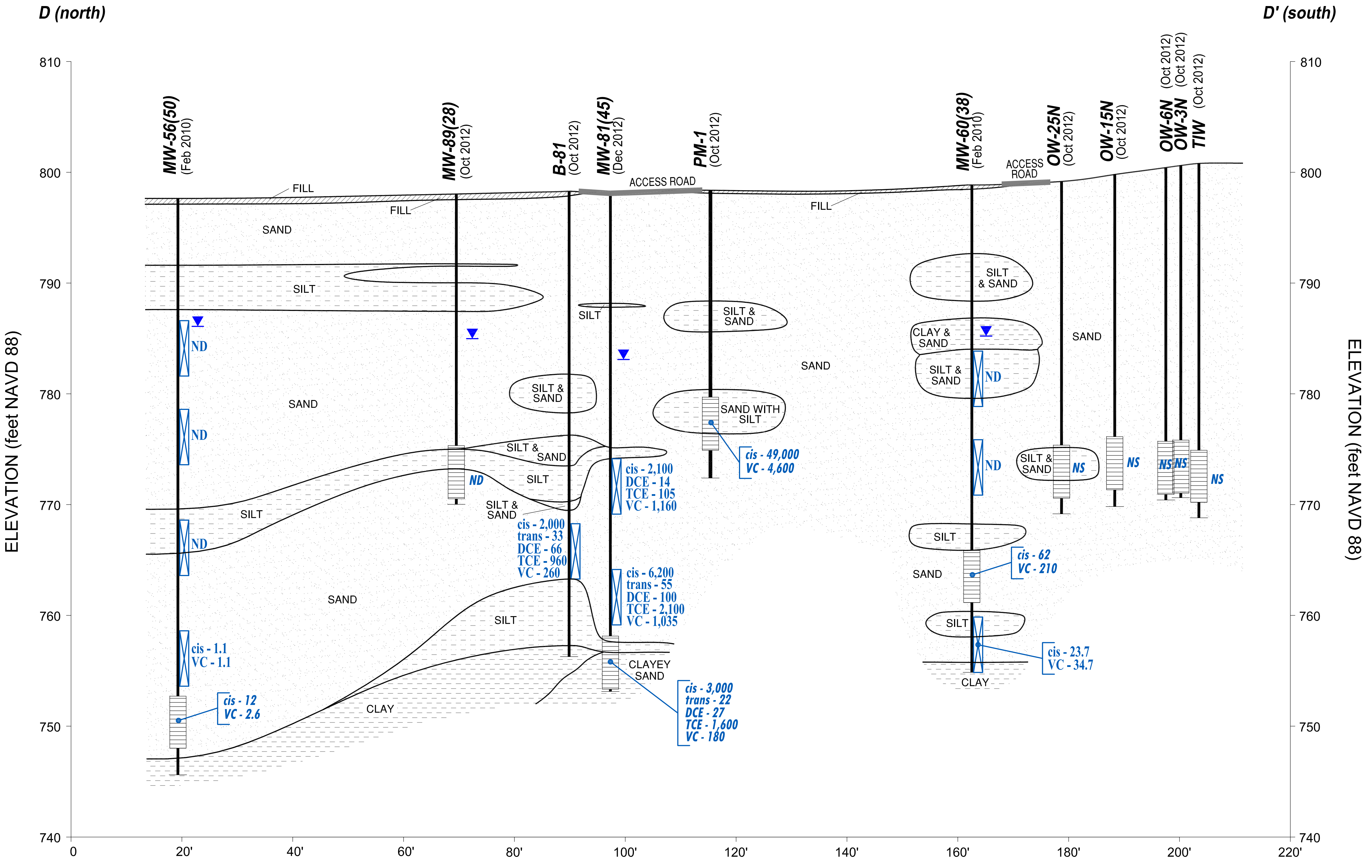
FIGURE
3-4
SHEET 1 of 1

GEOLOGIC
CROSS SECTION C-C'
NORTH to SOUTH

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\ TFS Sections Jan 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Well Screen

↑ Observed Vertical Groundwater Gradient

MW-81 (Dec 2012) Well Location & Date Installed

VC - 11 Site-related VOCs Results from Spring 2013

cis - 5.2 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

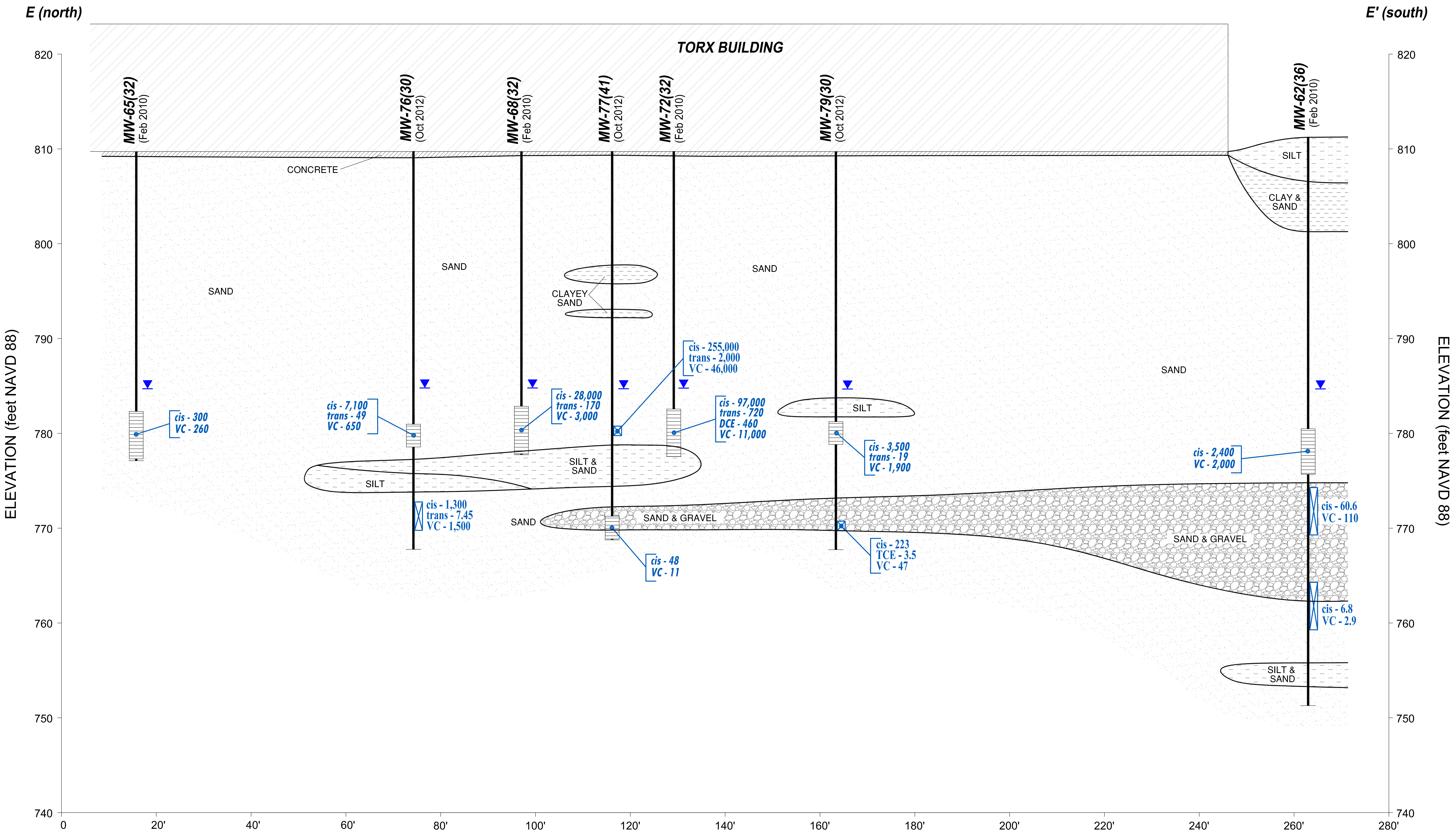
VOC results reported in micrograms per liter (μg/L)
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
J - Estimated value
NAVD 88 North American Vertical Datum 1988

FIGURE
3-5
SHEET 1 of 1

GEOLOGIC
CROSS SECTION D-D'
NORTH to SOUTH

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\ TFS Sections Jan 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Well Screen

↑ Observed Vertical Groundwater Gradient

MW-65 (Feb 2010) Well Location & Date Installed

VC - 11 Site-related VOCs Results from Spring 2013

cis - 6.8 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dicloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (µg/L)
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
J - Estimated value
NAVD 88 North American Vertical Datum 1988

FIGURE **3-6**
SHEET 1 of 1

GEOLOGIC
CROSS SECTION E-E'
NORTH to SOUTH

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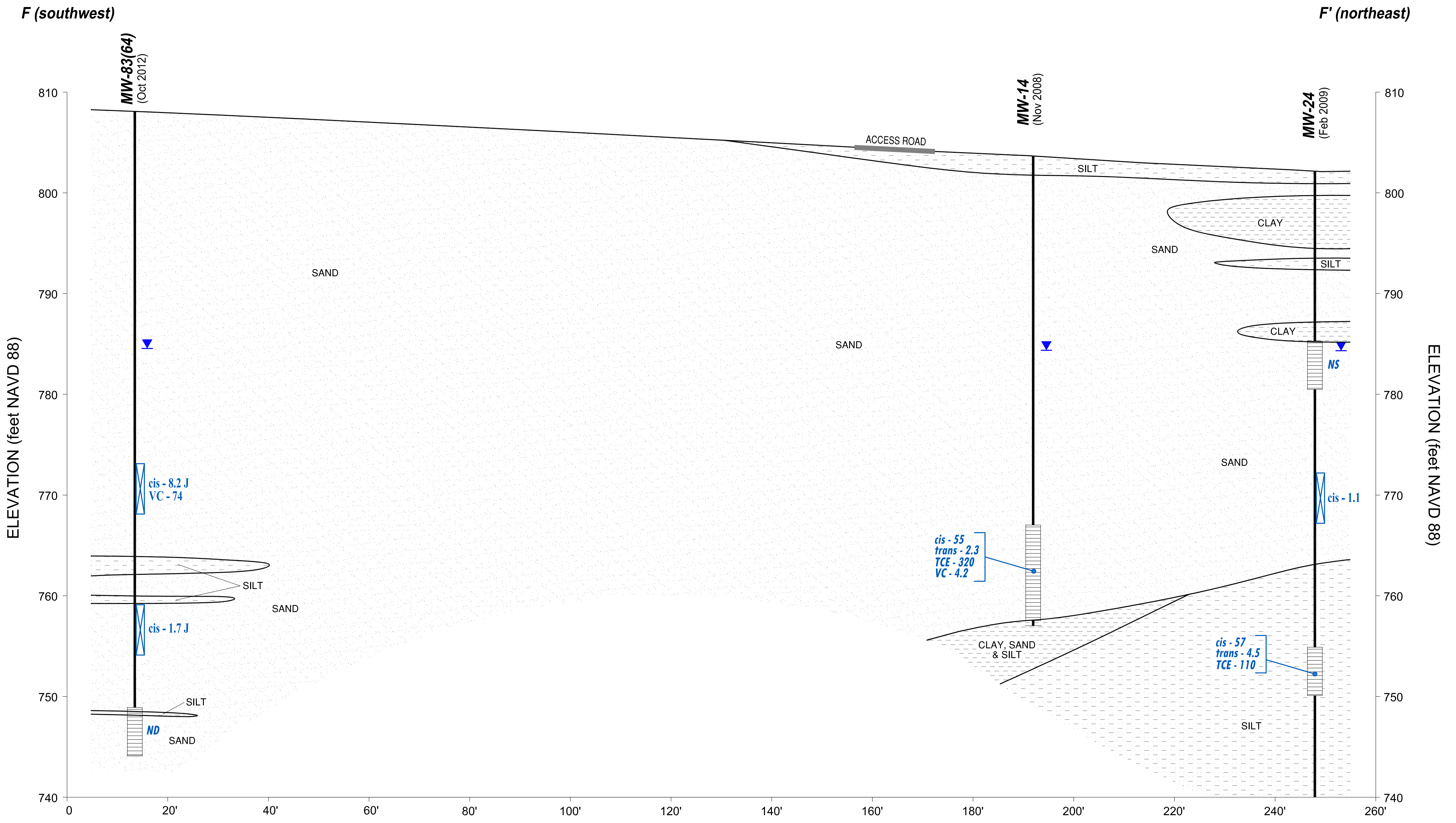
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\ TFS Sections Jan 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Well Screen

↑ Observed Vertical Groundwater Gradient

MW-83 (Oct 2012) Well Location & Date Installed

VC - 11 Site-related VOCs Results from Spring 2013

cis - 1.1 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene	DCE - 1,1-Dichloroethene
trans - trans-1,2-Dichloroethene	VC - Vinyl Chloride
TCE - Trichloroethene	

VOC results reported in micrograms per liter (μg/L)
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
J - Estimated value
NAVD 88 North American Vertical Datum 1988

FIGURE
3-7
SHEET 1 of 1

GEOLOGIC
CROSS SECTION F-F'
SOUTHWEST to NORTHEAST

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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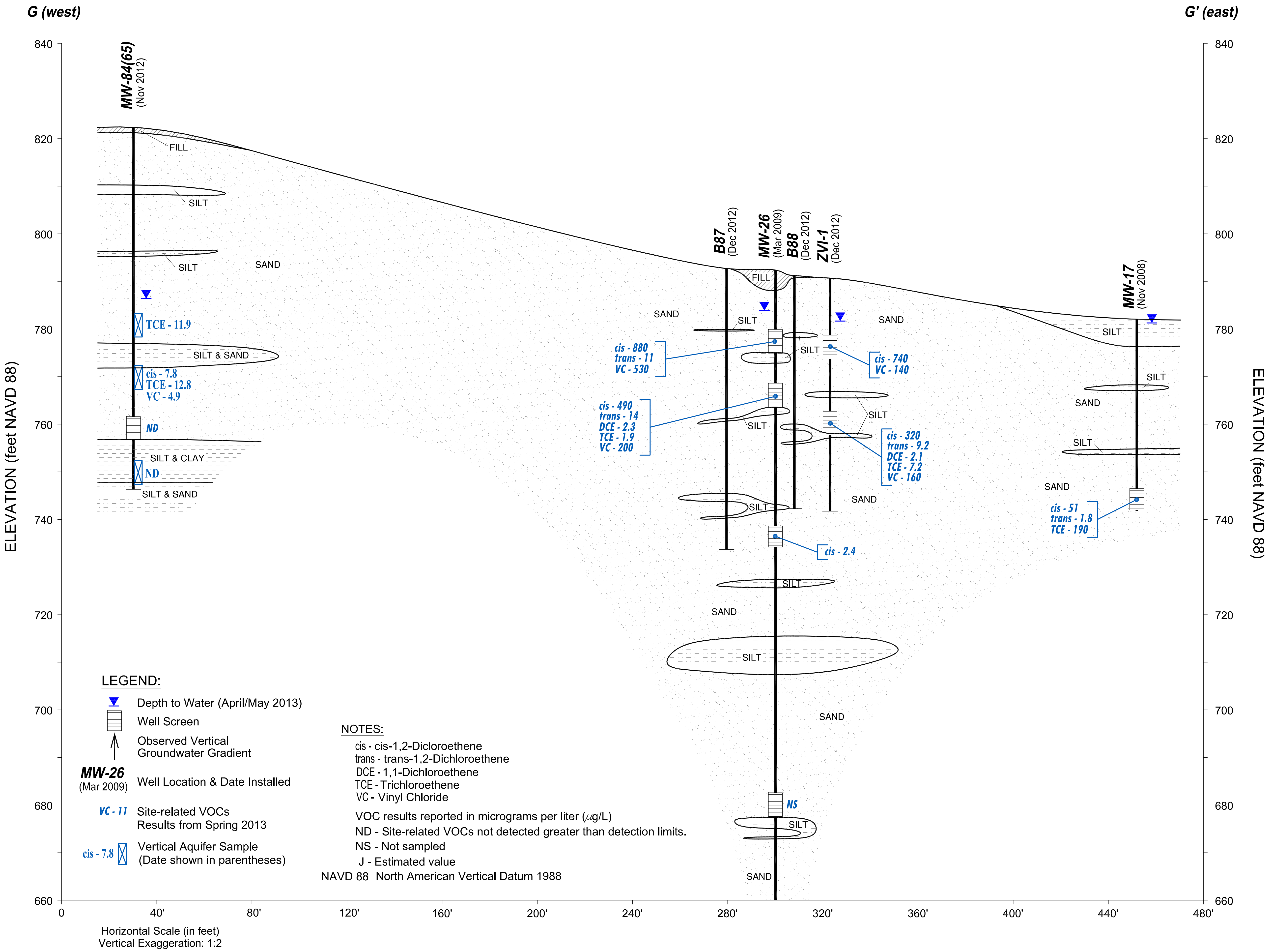
FILE NO. P:\Textron\TFS\Drawings\TFS Sections Jan 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE



LEGEND:

▼ Depth to Water (April/May 2013)
▤ Well Screen
↑ Observed Vertical Groundwater Gradient
MW-26 (Mar 2009) Well Location & Date Installed
VC - 11 Site-related VOCs Results from Spring 2013
cis - 7.8 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (μg/L)
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
J - Estimated value
NAVD 88 North American Vertical Datum 1988

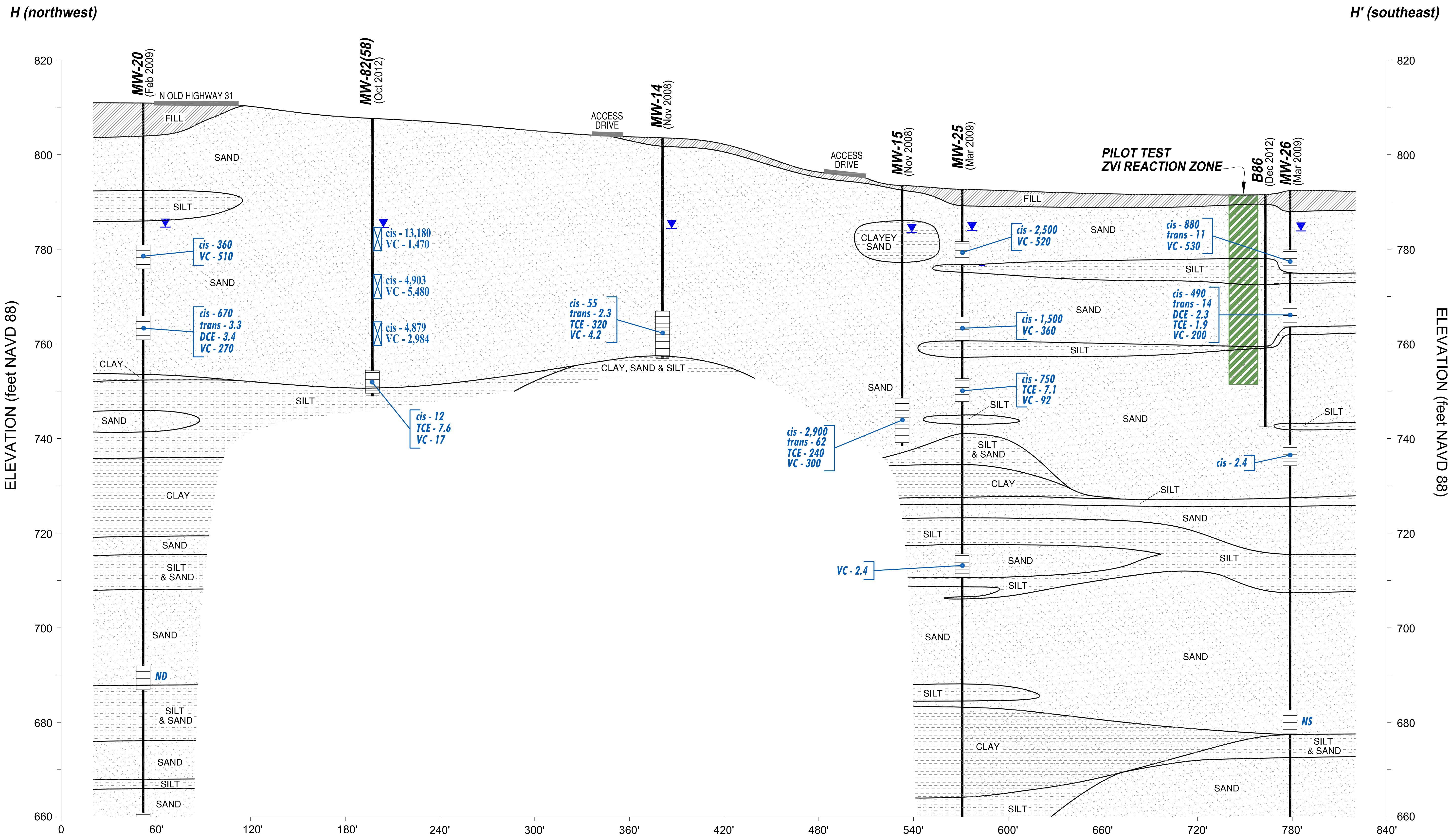
FIGURE
3-8
SHEET 1 of 1

GEOLOGIC
CROSS SECTION G-G'
WEST to EAST

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY
RLB
FILE NO.
P:\Textron\TFS\Drawings\
TFS Sections Jan 2013.dwg
APPROVED BY
PJS
DATE
June 2014
SOURCE
Survey provided by Territorial Engineering, LLC
PROJECT NO.
3359 12 2618
SCALE
SEE ABOVE



Horizontal Scale (in feet)
Vertical Exaggeration: 1:3

LEGEND:

- 🔽 Depth to Water (April/May 2013)
- ▤ Well Screen
- ↑ Observed Vertical Groundwater Gradient
- **MW-20** (Feb 2009) Well Location & Date Installed
- ***VC - 11*** Site-related VOCs Results from Spring / Summer 2013
- cis - 7.8 ☒ Vertical Aquifer Sample (Date shown in parentheses)

NOTES:

cis - cis-1,2-Dicloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride

VOC results reported in micrograms per liter (μg/L)

ND - Site-related VOCs not detected greater than detection limits.

NS - Not sampled

J - Estimated value

NAVD 88 North American Vertical Datum 1988

FIGURE 3-9

SHEET 1 of 1

GEOLOGIC
CROSS SECTION H-H'
NORTHWEST to SOUTHEAST

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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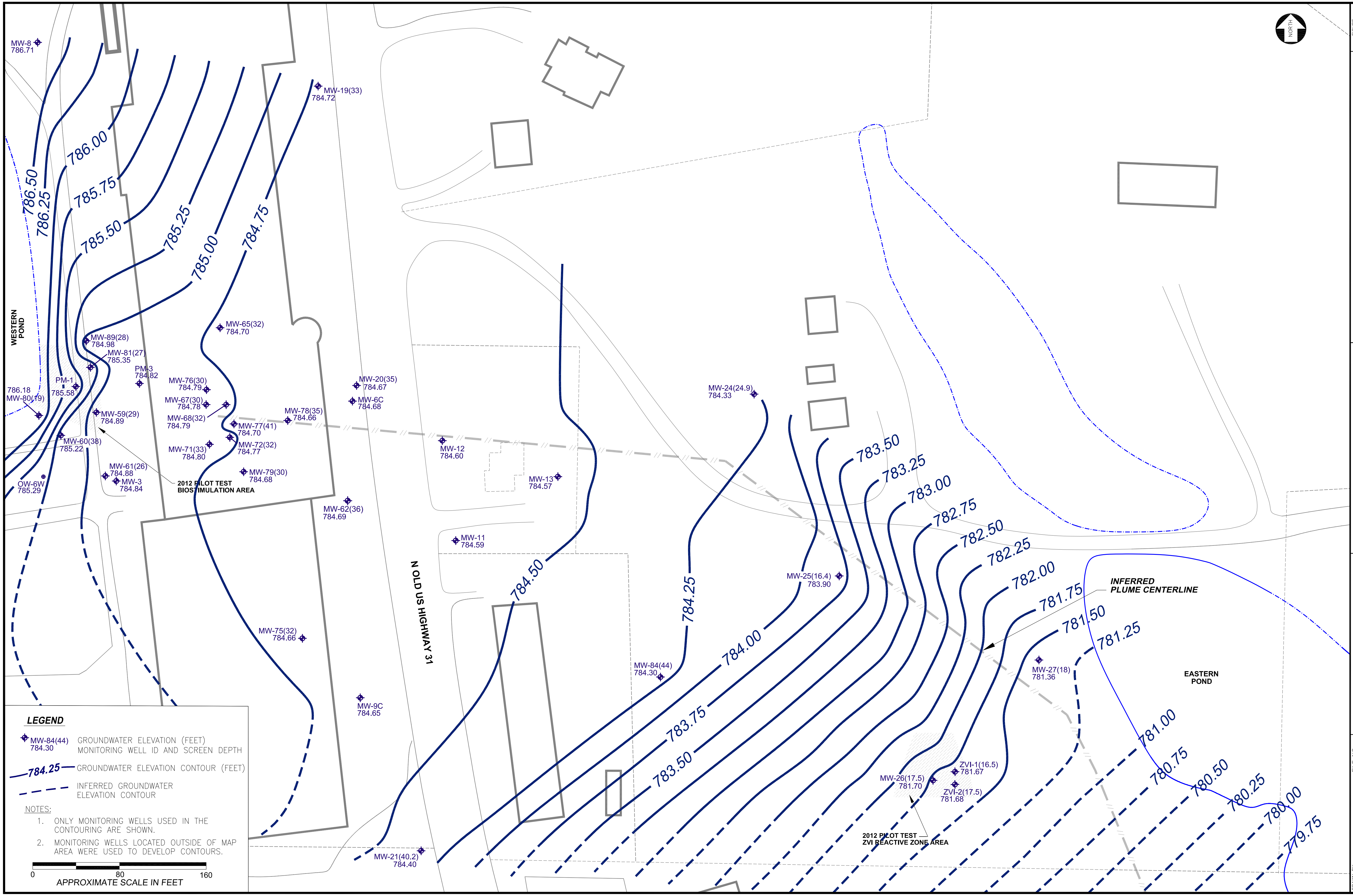
FILE NO. P:\Textron\TFS\Drawings\ TFS Sections Jan 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE



LEGEND

⌖ MW-84(44) 784.30	GROUNDWATER ELEVATION (FEET) MONITORING WELL ID AND SCREEN DEPTH
784.25	GROUNDWATER ELEVATION CONTOUR (FEET)
– – –	INFERRED GROUNDWATER ELEVATION CONTOUR

NOTES:

1. ONLY MONITORING WELLS USED IN THE CONTOURING ARE SHOWN.
2. MONITORING WELLS LOCATED OUTSIDE OF MAP AREA WERE USED TO DEVELOP CONTOURS.

APPROXIMATE SCALE IN FEET

FIGURE
3-10

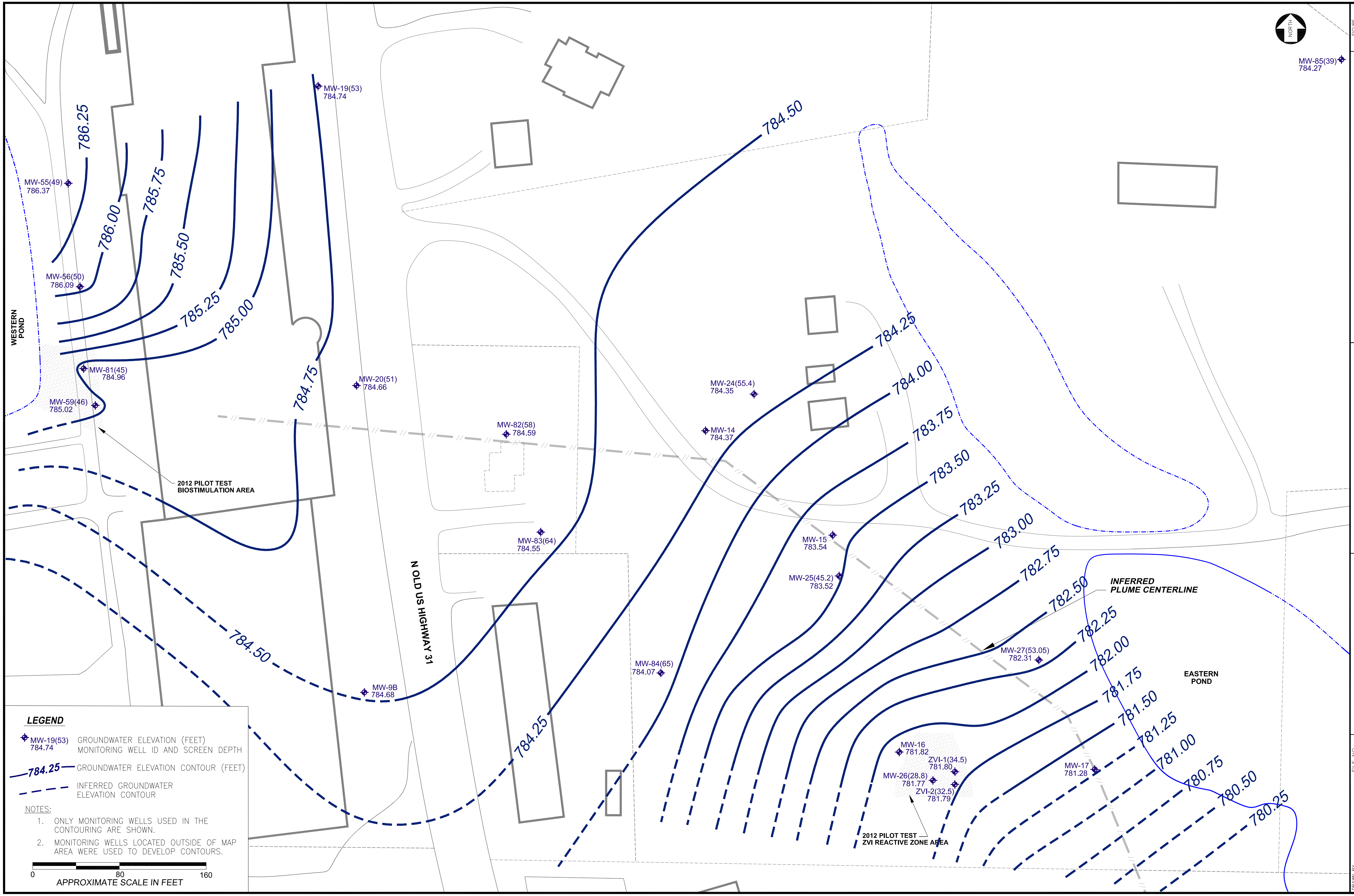
SHEET 1 of 1

GROUNDWATER CONTOUR MAP OF PROPOSED TREATMENT AREAS APRIL 29, 2013 - ZONE 1 (765 - 786 feet) SHALLOW OVERBURDEN WELLS

amec

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\GW Contours 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE



LEGEND

MW-19(53) 784.74	GROUNDWATER ELEVATION (FEET) MONITORING WELL ID AND SCREEN DEPTH
784.25	GROUNDWATER ELEVATION CONTOUR (FEET)
- - -	INFERRED GROUNDWATER ELEVATION CONTOUR

NOTES:

1. ONLY MONITORING WELLS USED IN THE CONTOURING ARE SHOWN.
2. MONITORING WELLS LOCATED OUTSIDE OF MAP AREA WERE USED TO DEVELOP CONTOURS.

0 80 160

APPROXIMATE SCALE IN FEET

FIGURE

3-11

SHEET 1 of 1

GROUNDWATER CONTOUR MAP
OF PROPOSED TREATMENT AREAS
APRIL 29, 2013 - ZONE 2 (730 - 765 feet)
INTERMEDIATE OVERBURDEN WELLS

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TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB

FILE NO. P:\Textron\TFS\Drawings\GW Contours 2013.dwg

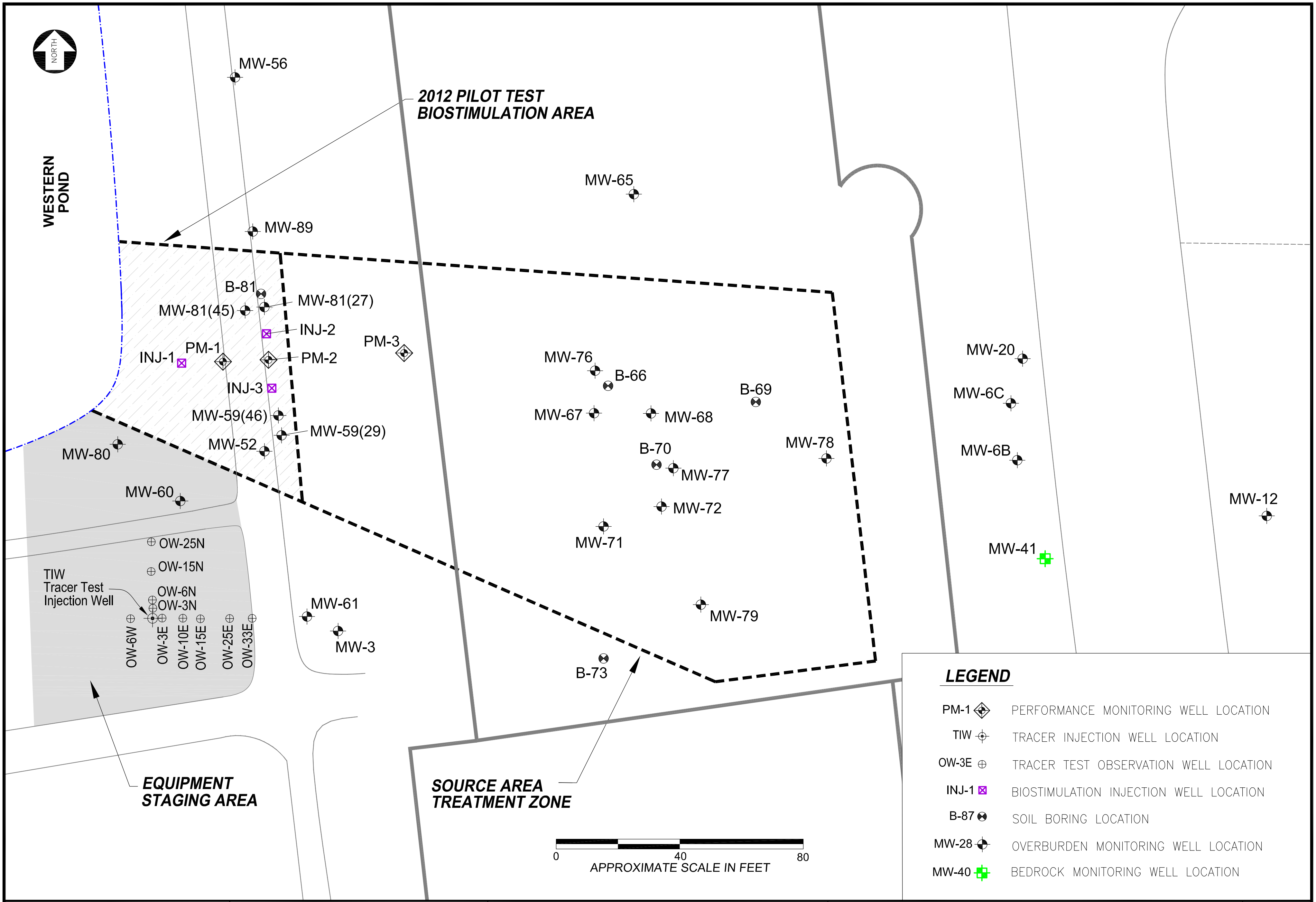
APPROVED BY PJS

DATE June 2014

SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.

PROJECT NO. 3359 12 2618

SCALE SEE ABOVE



DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\Areas 40 scale 2013.dwg		
APPROVED BY PJS	DATE June 2014		
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.			
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE		

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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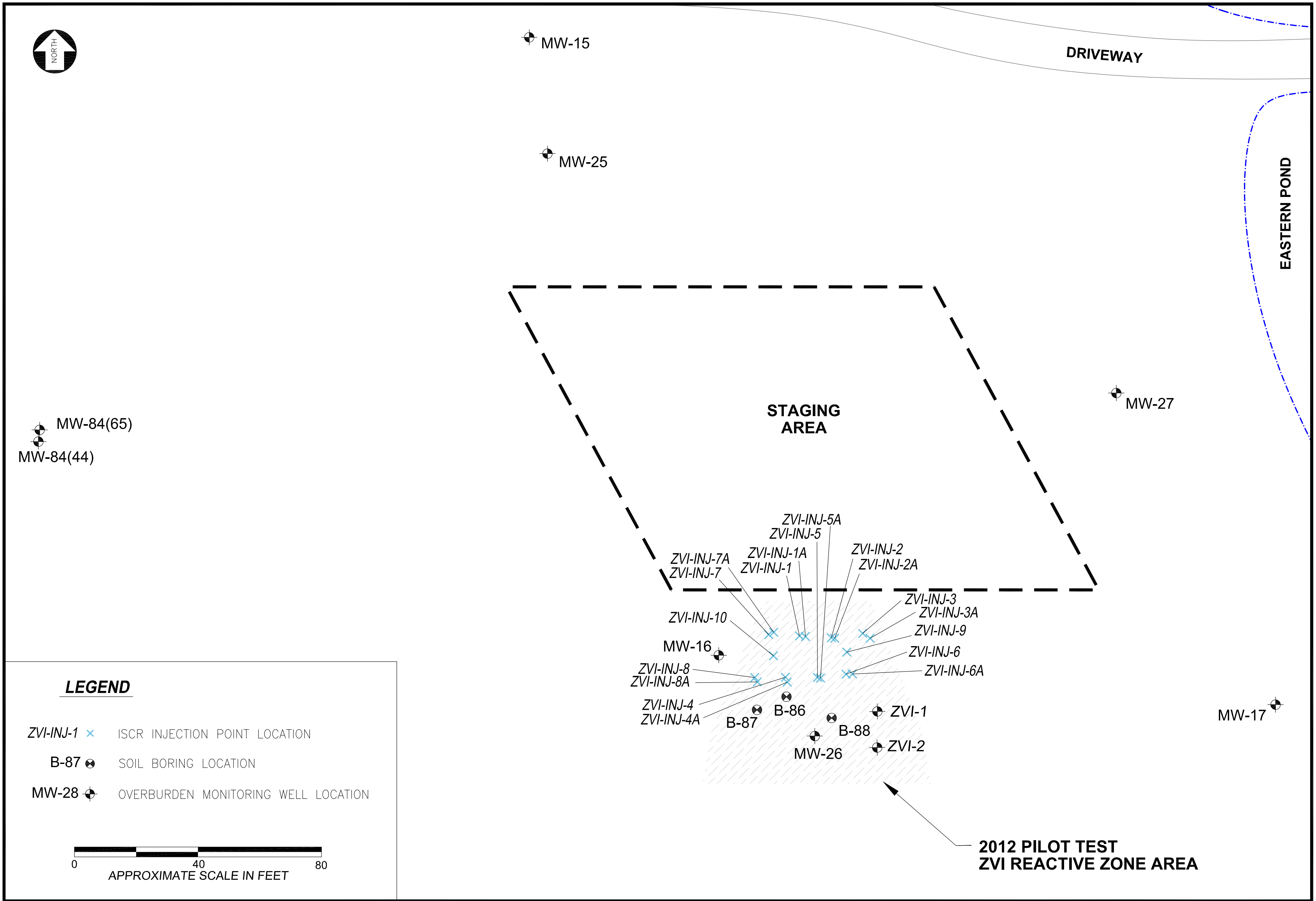
SOURCE AREA PRODUCT ABC
PILOT TEST STUDY AREA

FIGURE
6-1

SHEET 1 of 1



DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\Areas 40 scale 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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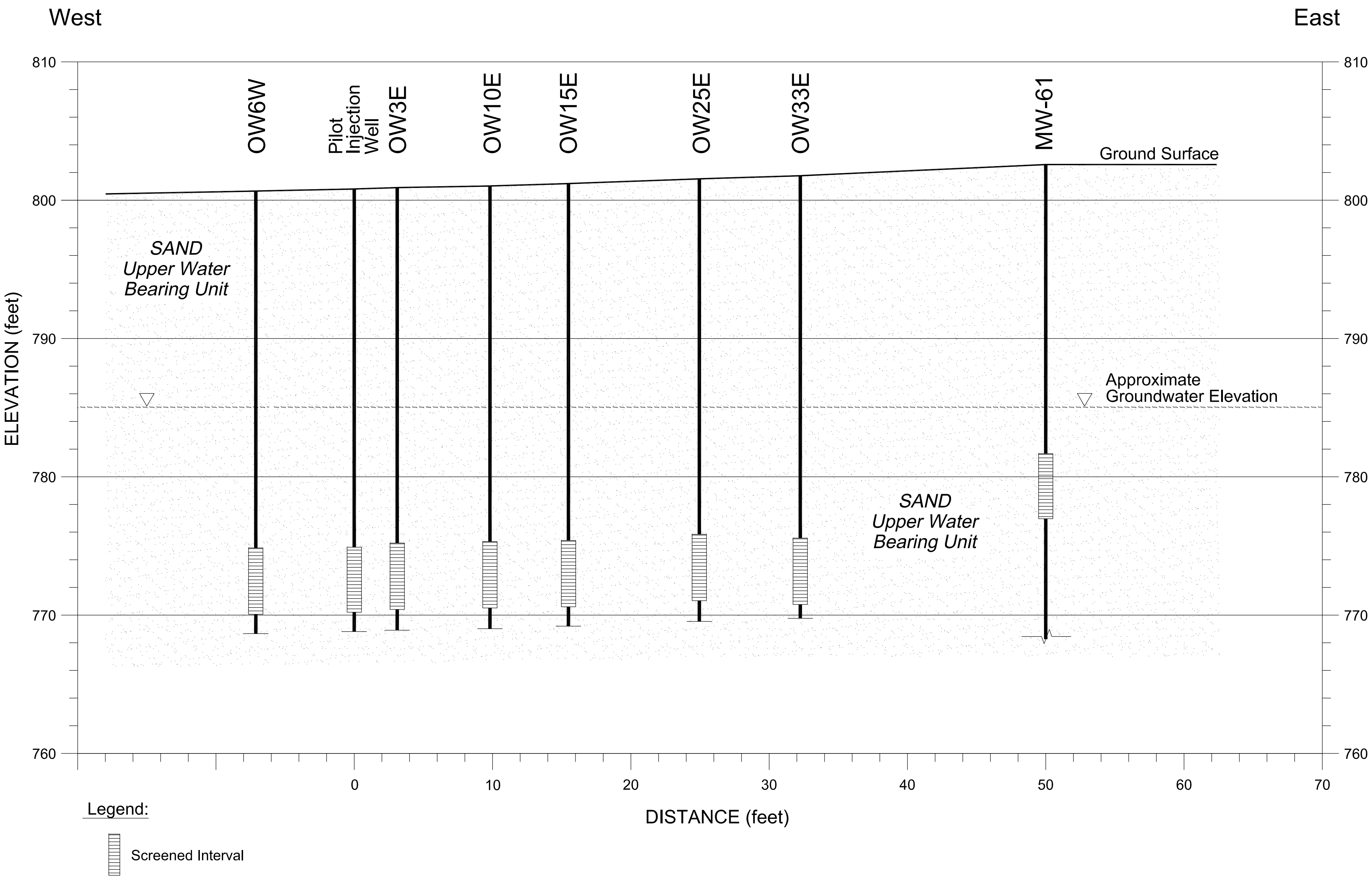
DOWN-GRADIENT PRODUCT ABC+ PILOT TEST STUDY AREA

FIGURE
6-2

SHEET 1 of 1



DRAWN BY
RLB
FILE NO.
P:\Textron\TFS\Drawings\Typ Flushmount Well.dwg
REVIEWED BY:
PJS
DATE
June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.
PROJECT NO.
3359 12 2618
APPROXIMATE SCALE
SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

CROSS SECTION OF PILOT
TRACER TEST WELLS
West - East

FIGURE
6-3

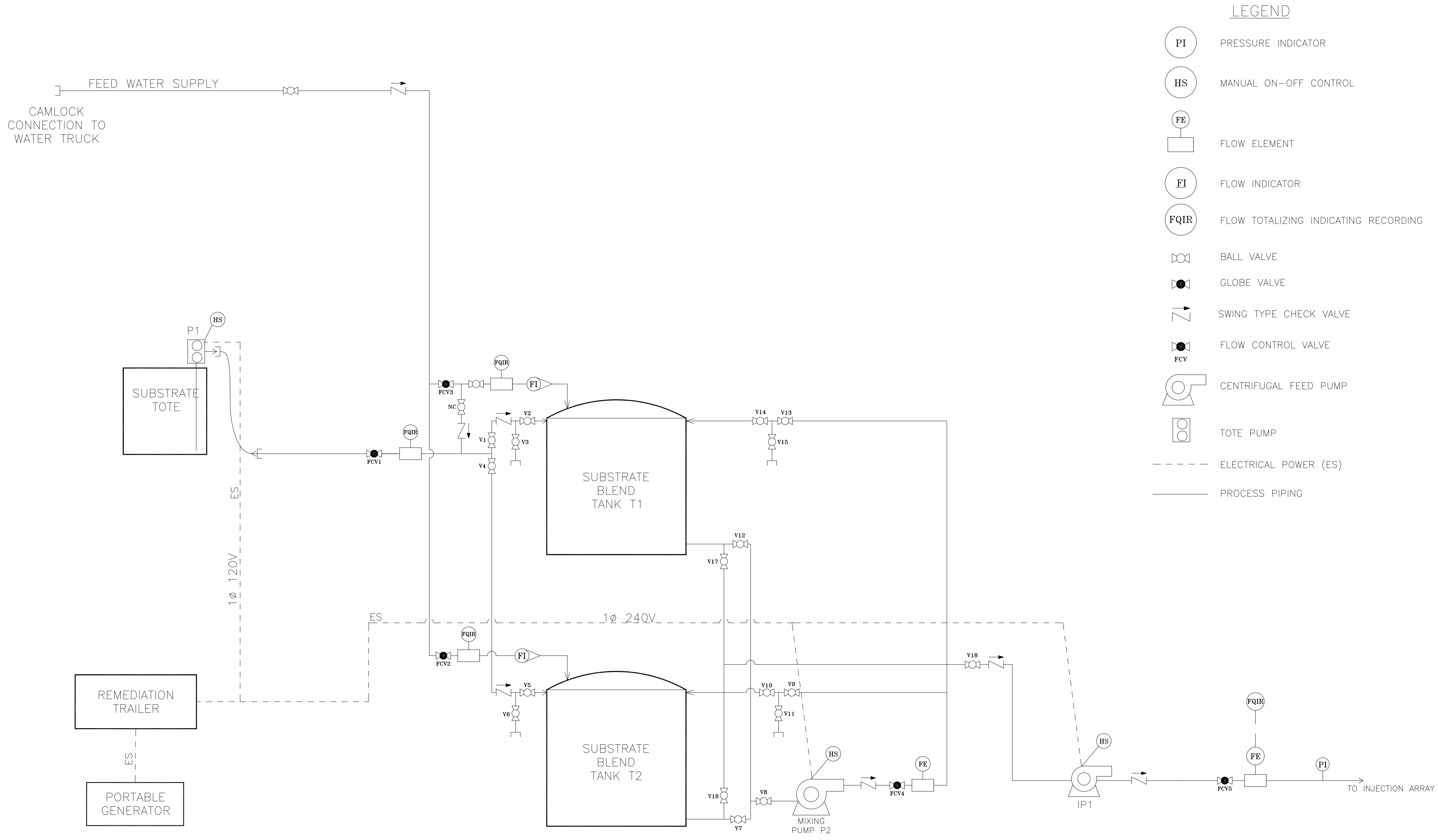


FIGURE
6-4
SHEET 1 of 1

PILOT TEST
PROCESS EQUIPMENT SCHEMATIC
FOR PRODUCT ABC

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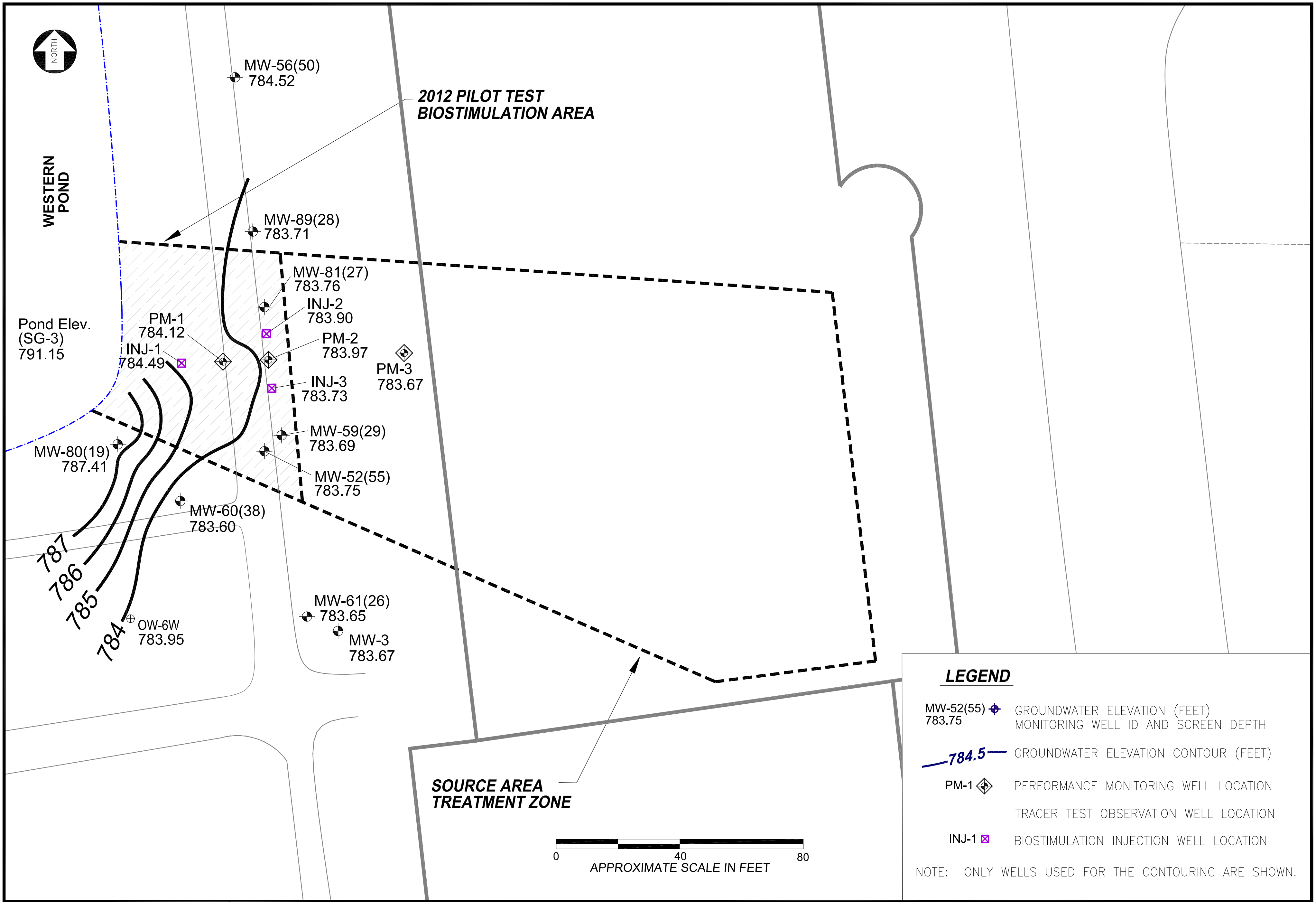
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\Alternative Remediations.dwg
APPROVED BY PJS	DATE June 2014
SOURCE	
PROJECT NO. 3359 12 2618	SCALE NOT TO SCALE



DRAWN BY RLB	FILE NO. P:\Textron\TFS\ Drawings\Areas 40 scale 2013.dwg		
APPROVED BY PJS	DATE June 2014		
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.			
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE		

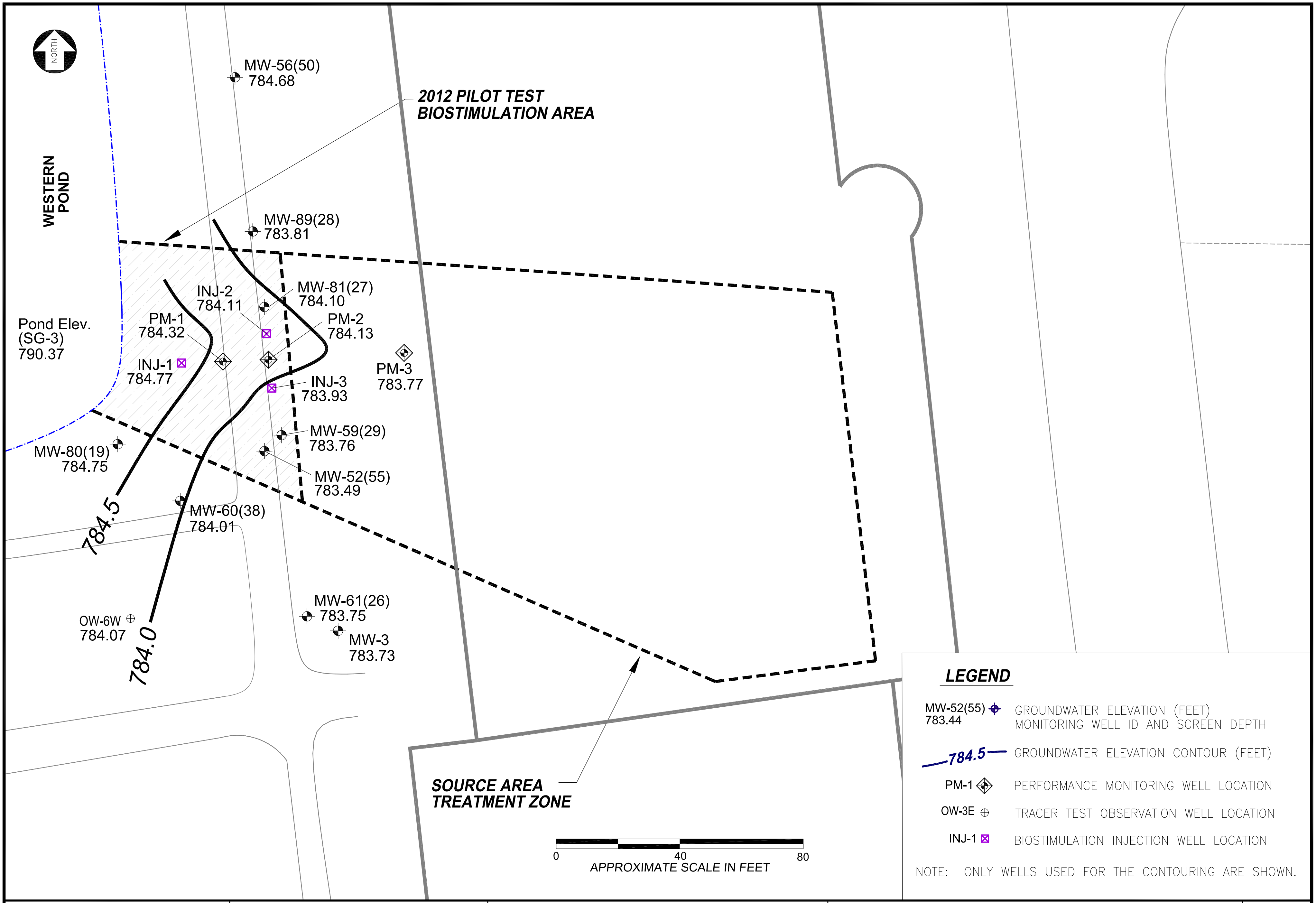
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

GROUNDWATER SURFACE CONTOUR MAP - SOURCE AREA DECEMBER 17, 2012

FIGURE
6-5

SHEET 1 of 1



DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\Areas 40 scale 2013.dwg
APPROVED BY PJS
DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005.
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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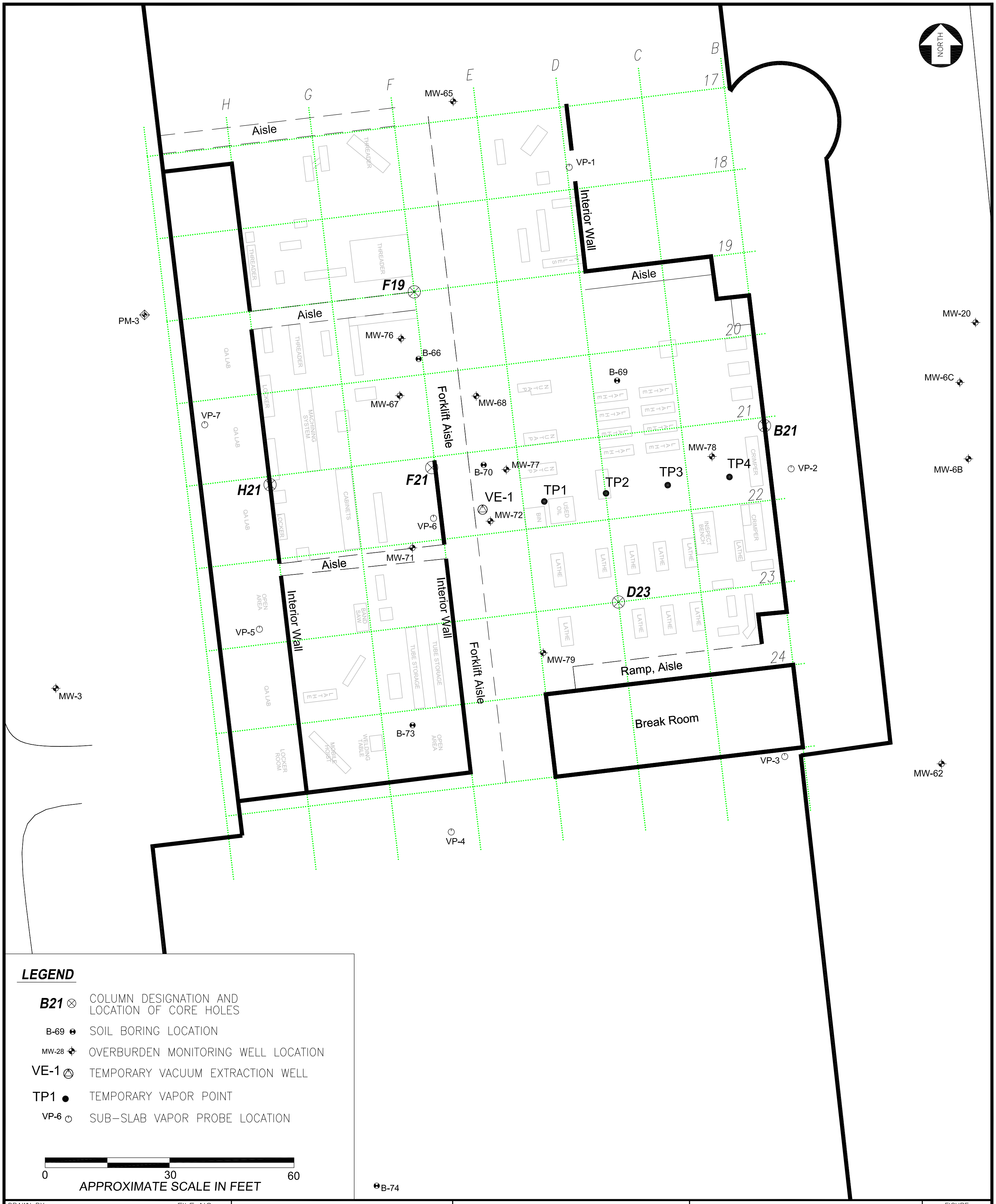
GROUNDWATER SURFACE CONTOUR MAP - SOURCE AREA MARCH 4, 2013

FIGURE
6-6

SHEET 1 of 1



LEGEND

B21 ⊗ COLUMN DESIGNATION AND LOCATION OF CORE HOLES

B-69 ● SOIL BORING LOCATION

MW-28 ✦ OVERBURDEN MONITORING WELL LOCATION

VE-1 △ TEMPORARY VACUUM EXTRACTION WELL

TP1 ● TEMPORARY VAPOR POINT

VP-6 ○ SUB-SLAB VAPOR PROBE LOCATION

0 30 60

APPROXIMATE SCALE IN FEET

DRAWN BY RLB	FILE NO. P:\Textron\TFS\ Drawings\Sub Slab 2013.dwg
APPROVED BY PJS	DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005; historical maps from Textron	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

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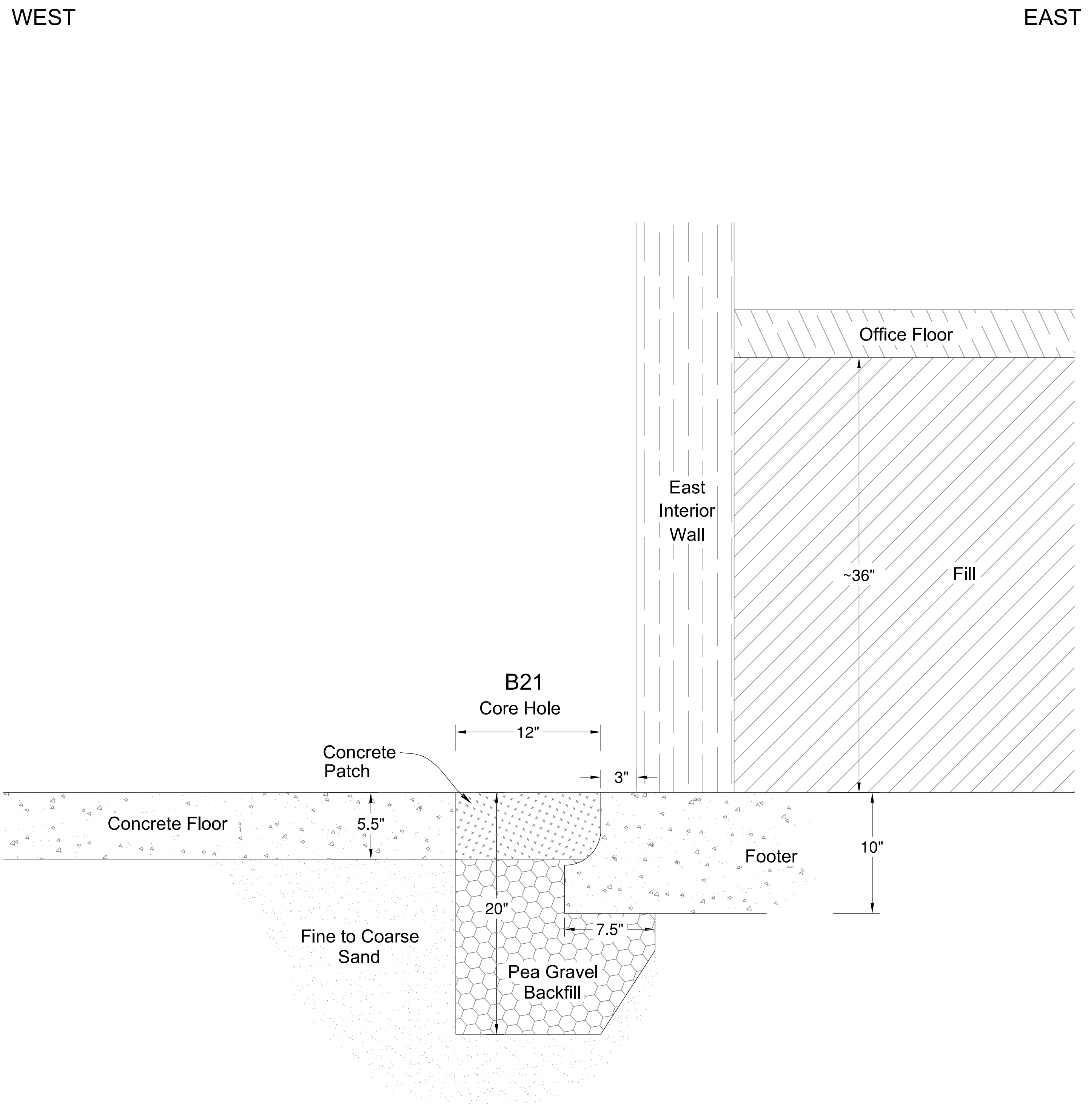
SUB-SLAB DEPRESSURIZATION PILOT TEST WELLS

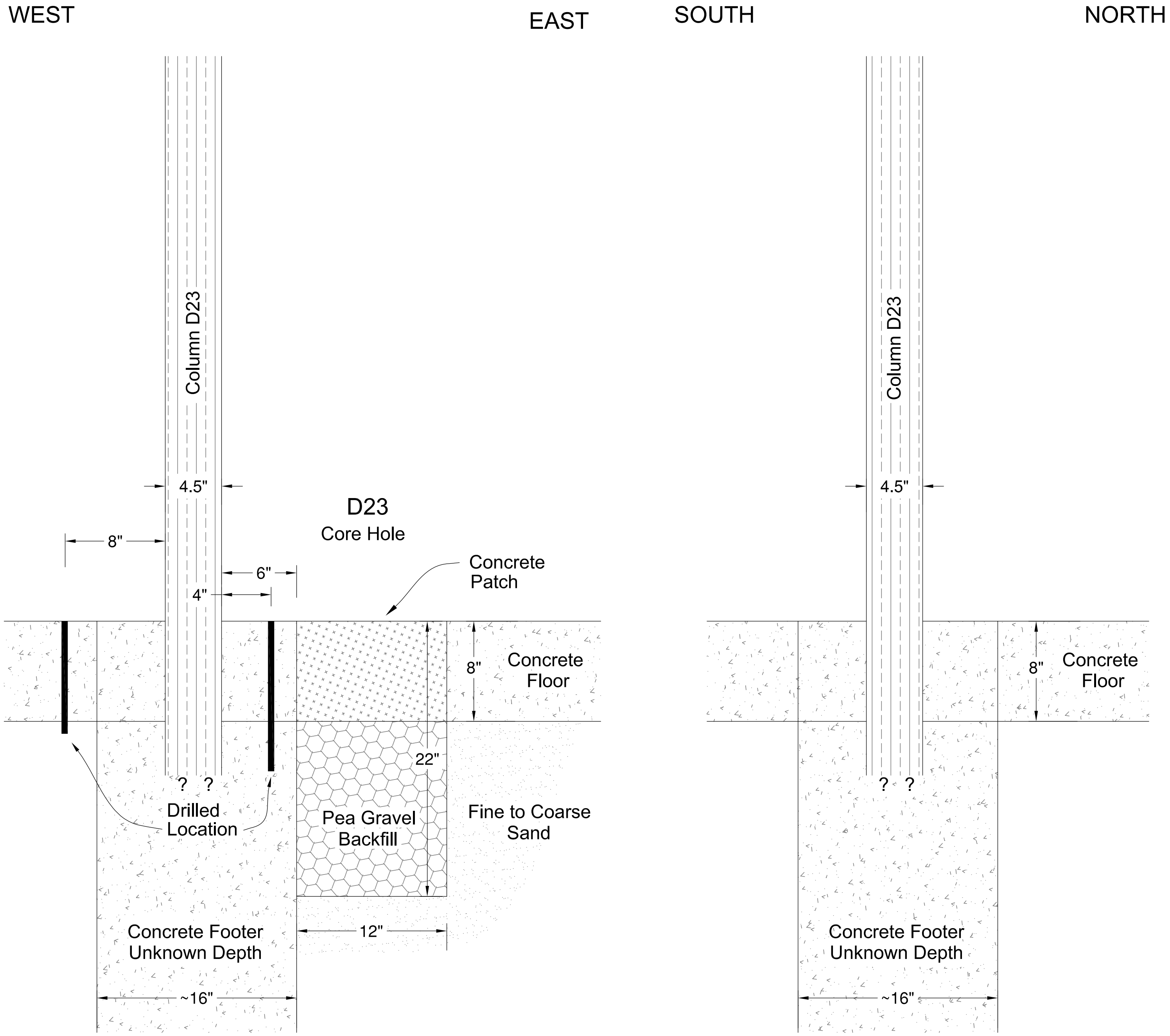
FIGURE
6-7

SHEET 1 of 1



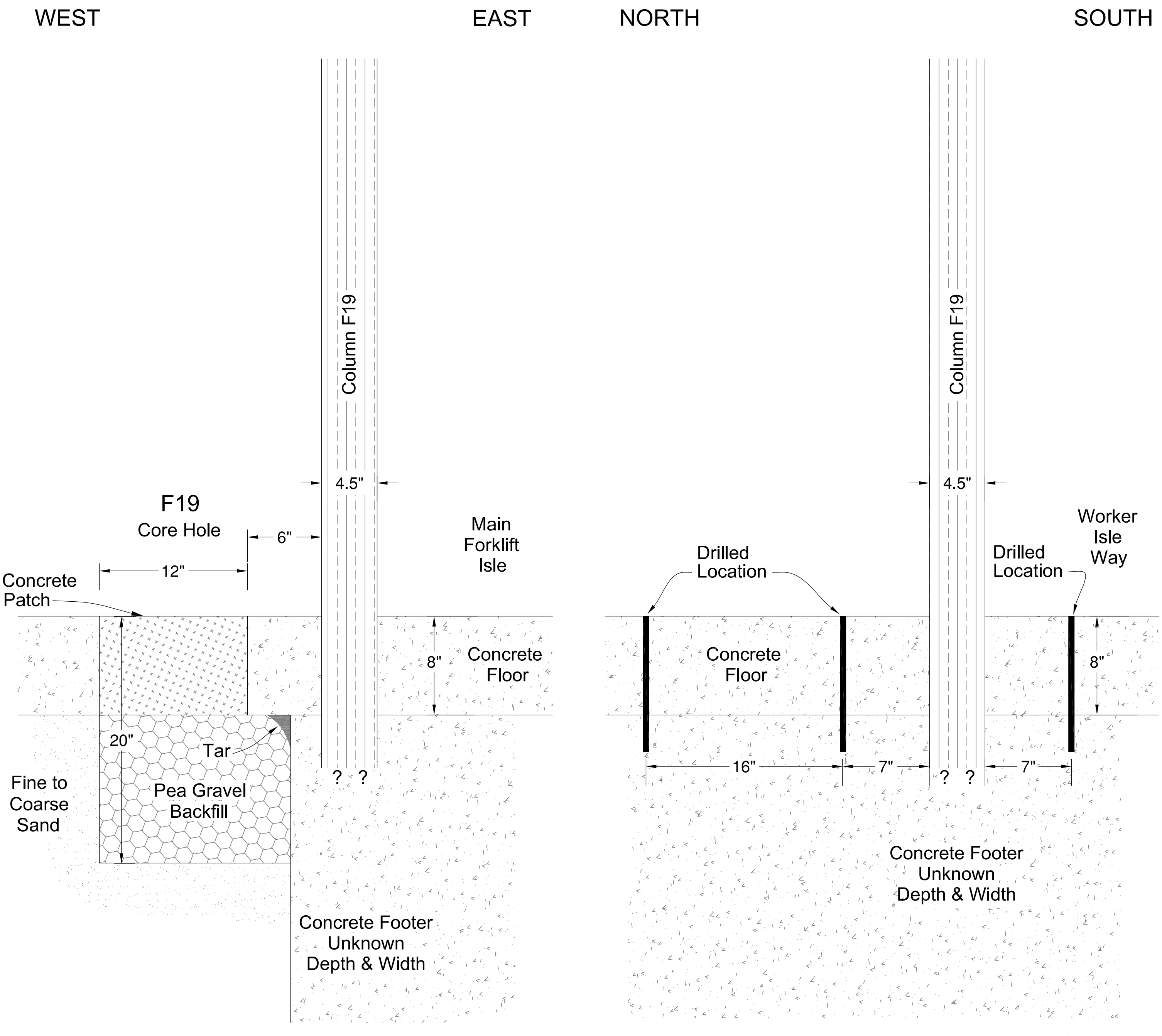
APPROXIMATE SCALE:
1" = 1'

DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS Core Sections.dwg APPROVED BY PJS DATE June 2014 SOURCE Survey provided by Territorial Engineering, LLC PROJECT NO. 3359 12 2618 SCALE SEE ABOVE	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	amec	**CROSS SECTION OF** **B21 WALL** **SUPPORT FOOTER**	FIGURE **6-8** SHEET 1 of 1



APPROXIMATE SCALE:
1" = 1'

DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS Core Sections.dwg APPROVED BY PJS DATE June 2014 SOURCE Survey provided by Territorial Engineering, LLC PROJECT NO. 3359 12 2618 SCALE SEE ABOVE	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	amec	**CROSS SECTION OF** **D23 COLUMN** **SUPPORT FOOTER**	FIGURE **6-9** SHEET 1 of 1



Note: Vacuum response at VP-1
suggests footer is not continuous.

APPROXIMATE SCALE:
1" = 1'

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\TFS Core Sections.dwg
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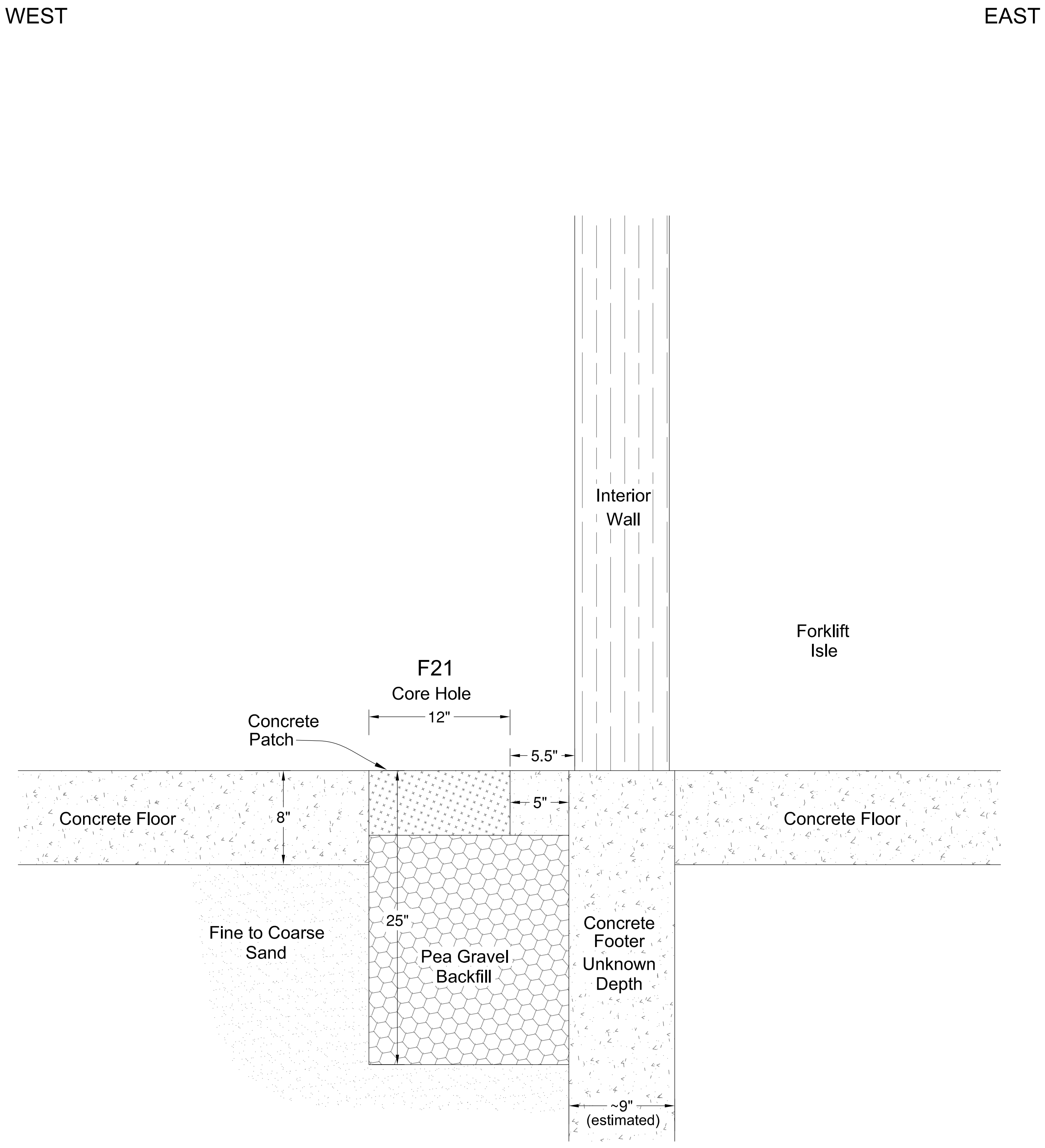
DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC
PROJECT NO. 3359 12 2618
SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

CROSS SECTION OF
F19 COLUMN
SUPPORT FOOTER

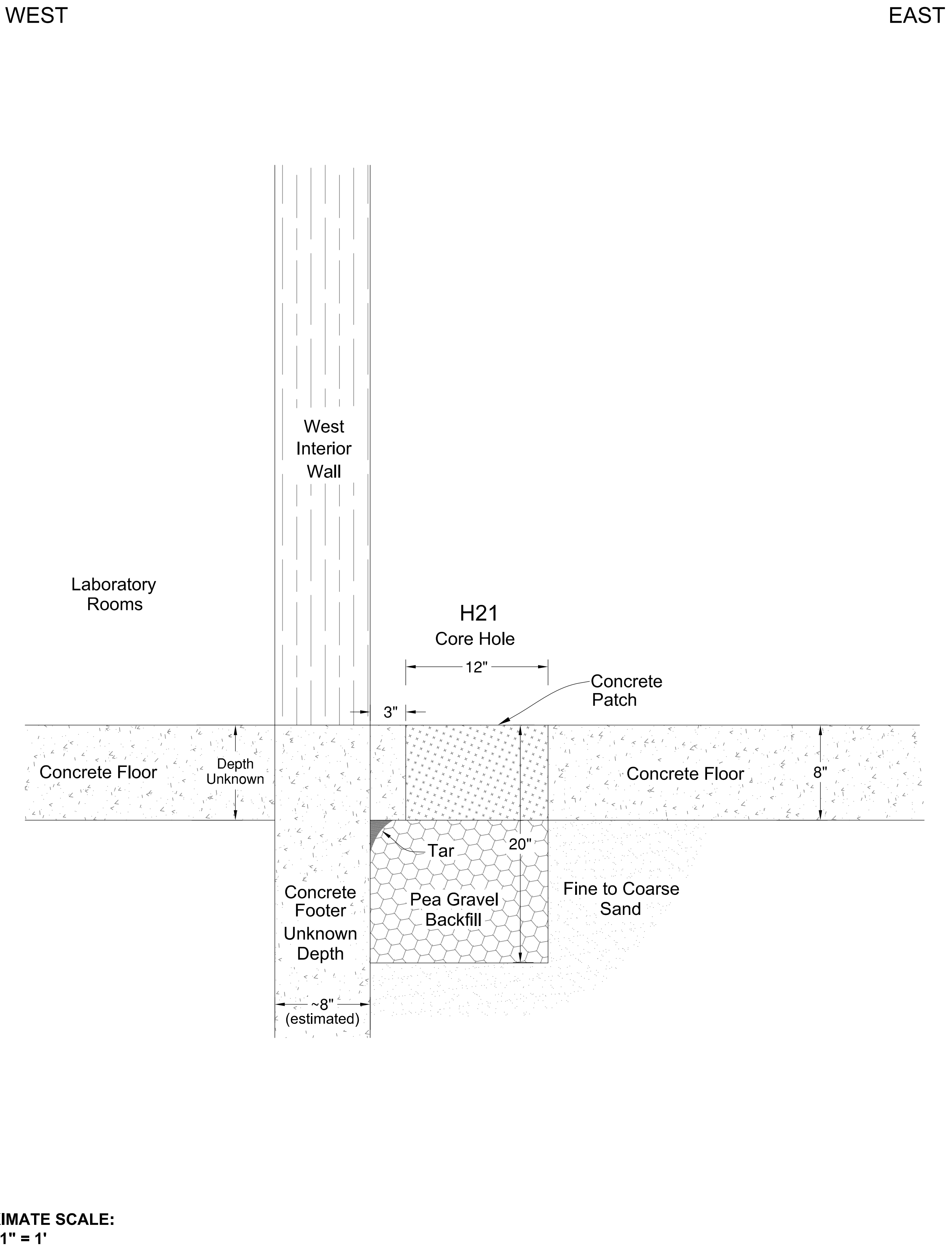
FIGURE
6-10

SHEET 1 of 1



APPROXIMATE SCALE:
1" = 1'

DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS Core Sections.dwg APPROVED BY PJS DATE June 2014 SOURCE Survey provided by Territorial Engineering, LLC PROJECT NO. 3359 12 2618 SCALE SEE ABOVE	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	amec	**CROSS SECTION OF** **F21 WALL** **SUPPORT FOOTER**	FIGURE **6-11** SHEET 1 of 1



APPROXIMATE SCALE:
1" = 1'

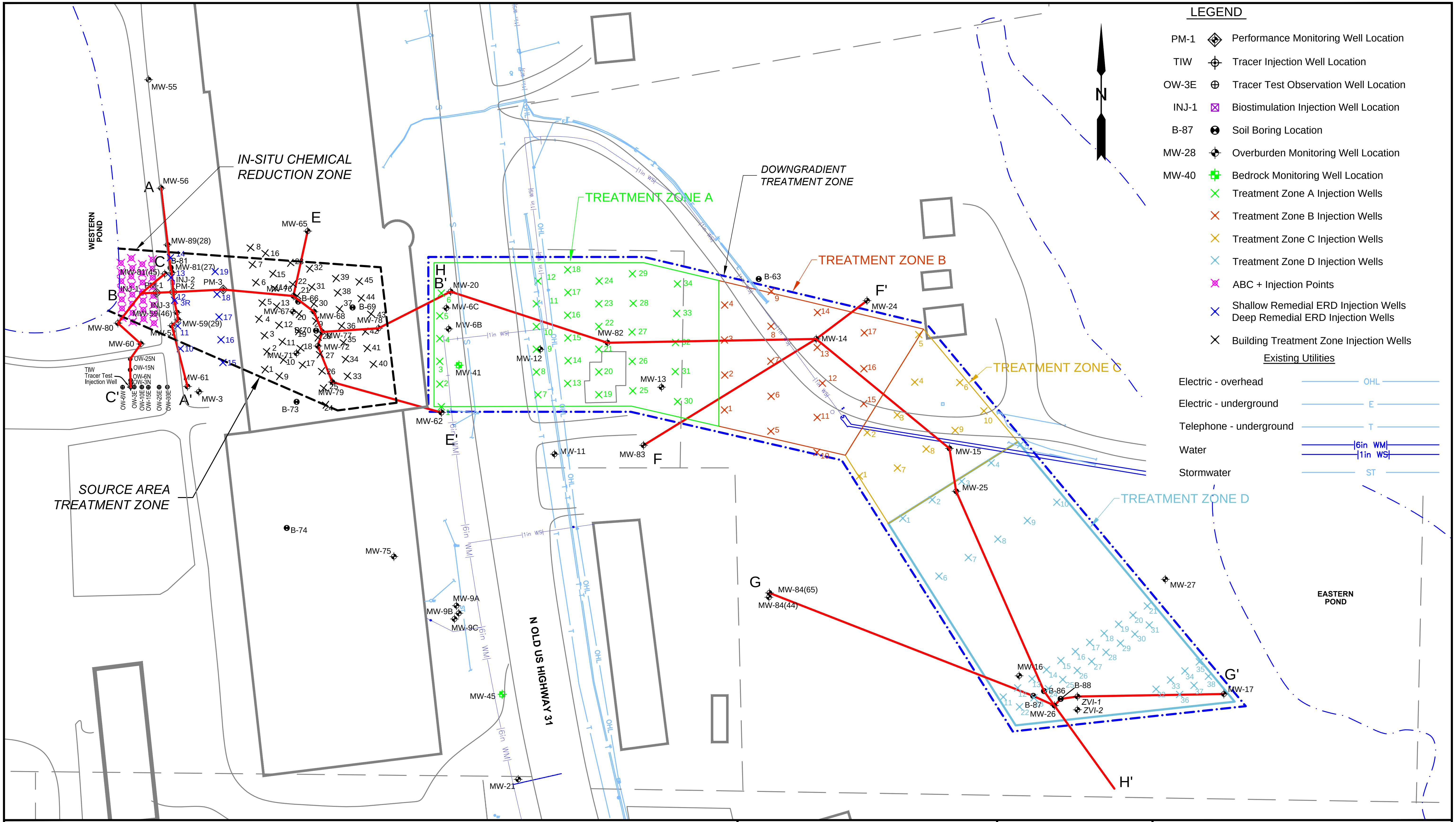
DRAWN BY
RLB
FILE NO.
P:\Textron\TFS\Drawings\TFS Core Sections.dwg
APPROVED BY
PJS
DATE
June 2014
SOURCE
Survey provided by Territorial Engineering, LLC
PROJECT NO.
3359 12 2618
SCALE
SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

CROSS SECTION OF
H21 WALL
SUPPORT FOOTER

FIGURE
6-12

SHEET 1 of 1



LEGEND

PM-1	◈	Performance Monitoring Well Location
TIW	⊕	Tracer Injection Well Location
OW-3E	⊕	Tracer Test Observation Well Location
INJ-1	☒	Biostimulation Injection Well Location
B-87	⊗	Soil Boring Location
MW-28	⊕	Overburden Monitoring Well Location
MW-40	🟩	Bedrock Monitoring Well Location
	×	Treatment Zone A Injection Wells
	×	Treatment Zone B Injection Wells
	×	Treatment Zone C Injection Wells
	×	Treatment Zone D Injection Wells
	⊗	ABC + Injection Points
	×	Shallow Remedial ERD Injection Wells Deep Remedial ERD Injection Wells
	×	Building Treatment Zone Injection Wells

Existing Utilities

Electric - overhead	OHL
Electric - underground	E
Telephone - underground	T
Water	6in WM 1in WS
Stormwater	ST

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CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
PLAN LAYOUT
SOURCE AREA AND TREATMENT ZONES
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 09-17-2013	DWG NO. C101 REV. B
SCALE: 0 80'		FIGURE. NO.: 8.1

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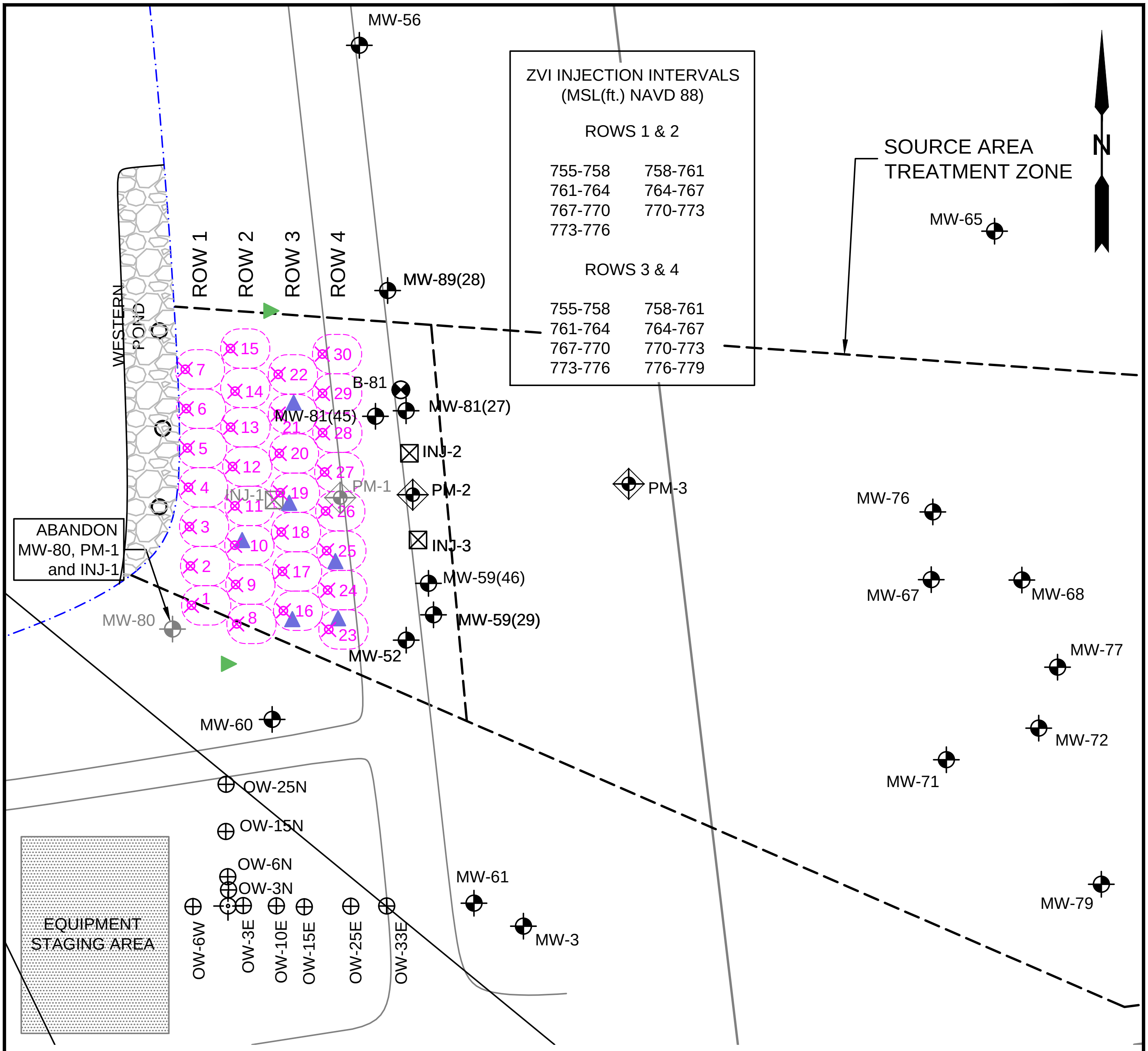

LEGEND

PM-1	◈	PERFORMANCE MONITORING WELL LOCATION	⊠	ZVI INJECTION POINTS
	⌖	TRACER INJECTION WELL LOCATION	⬚	INFERRED AREA OF INFLUENCE
OW-3E	⊕	TEST OBSERVATION WELL LOCATION	▶	BACKGROUND HPT/EC LOCATION
INJ-1	☒	BIOSTIMULATION INJECTION WELL LOCATION	▲	INJECTION MONITORING HPT/EC LOCATION
B-87	⊗	SOIL BORING LOCATION OVERBURDEN	○	POND MONITORING LOCATION
MW-28	⌖	MONITORING WELL LOCATION	▨	GRAVEL BACKFILL AREA

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CLIENT:
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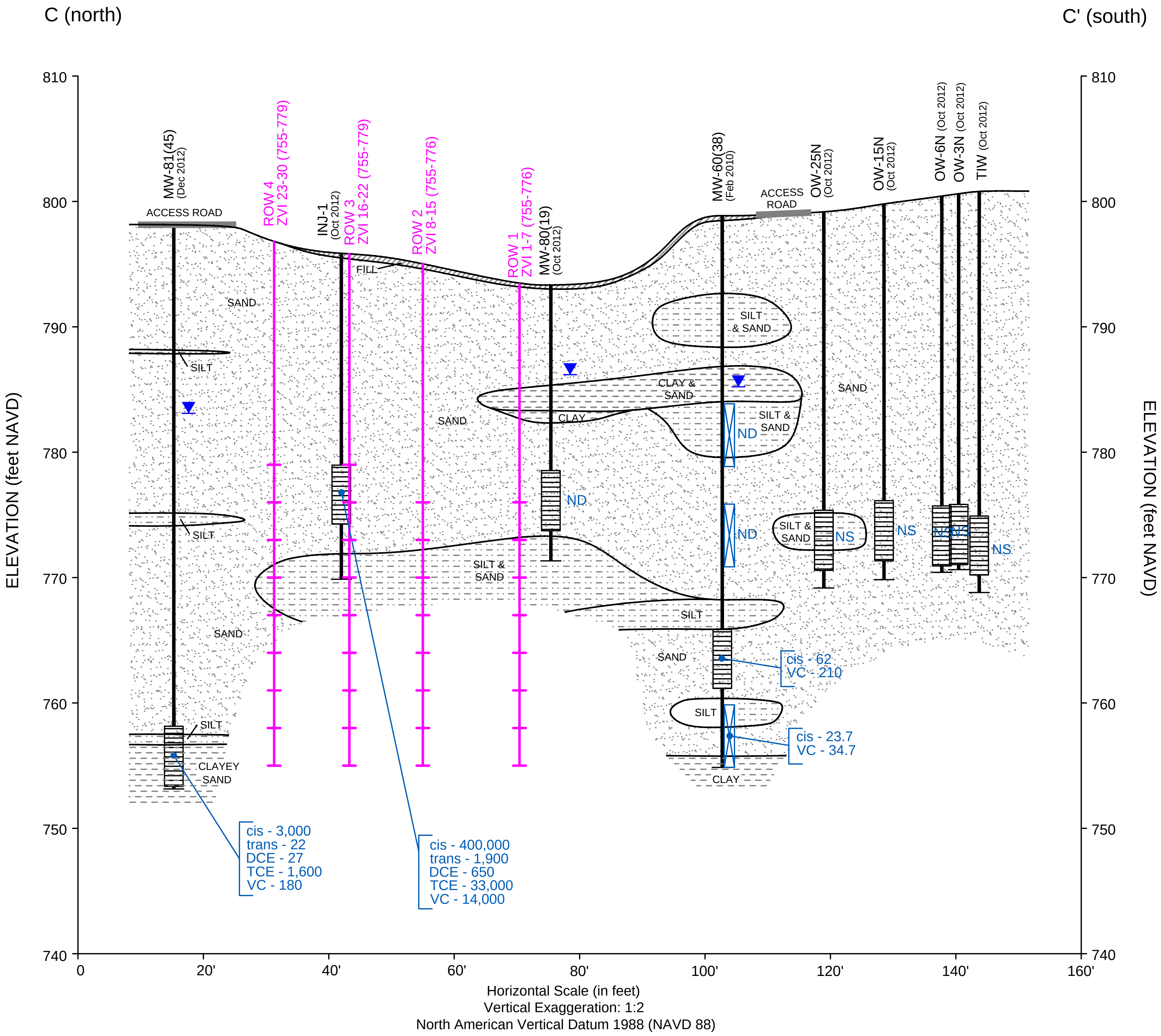
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
SOURCE AREA
ABC + INJECTION POINTS
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: ALA	PROJ. NO.: 3359122618.17.08
CHK: JP	DATE: 9/16/2013	DWG NO. C102 REV. A
SCALE: 0 30'		FIGURE. NO.: 8.2

P:\CADD\Projects\3359\3359122618\Task 08\F 08-02 Source Area ZVI Inj Pnts_01.dwg Jun. 17, 2014 paul.troxel



LEGEND:

▼	Depth to Water (April/May 2013)
I	ZVI Injection Interval (3 feet)
▤	Monitoring/Injection Well Screen
MW-56 (Feb 2010)	Well Location & Date Installed
VC-11	Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (μg/L)
ND ☒	Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (μg/L)
cis - 5.2* ☒	Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (μg/L)

NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride
ND - Site-related VOCs not detected
NS - Not sampled
NAVD 88 - North American Datum 1988

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CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
CROSS SECTION ZVI INJECTION
NORTH TO SOUTH
SOURCE AREA
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C103 REV. A
SCALE:	AS SHOWN	FIGURE. NO.: 8.3

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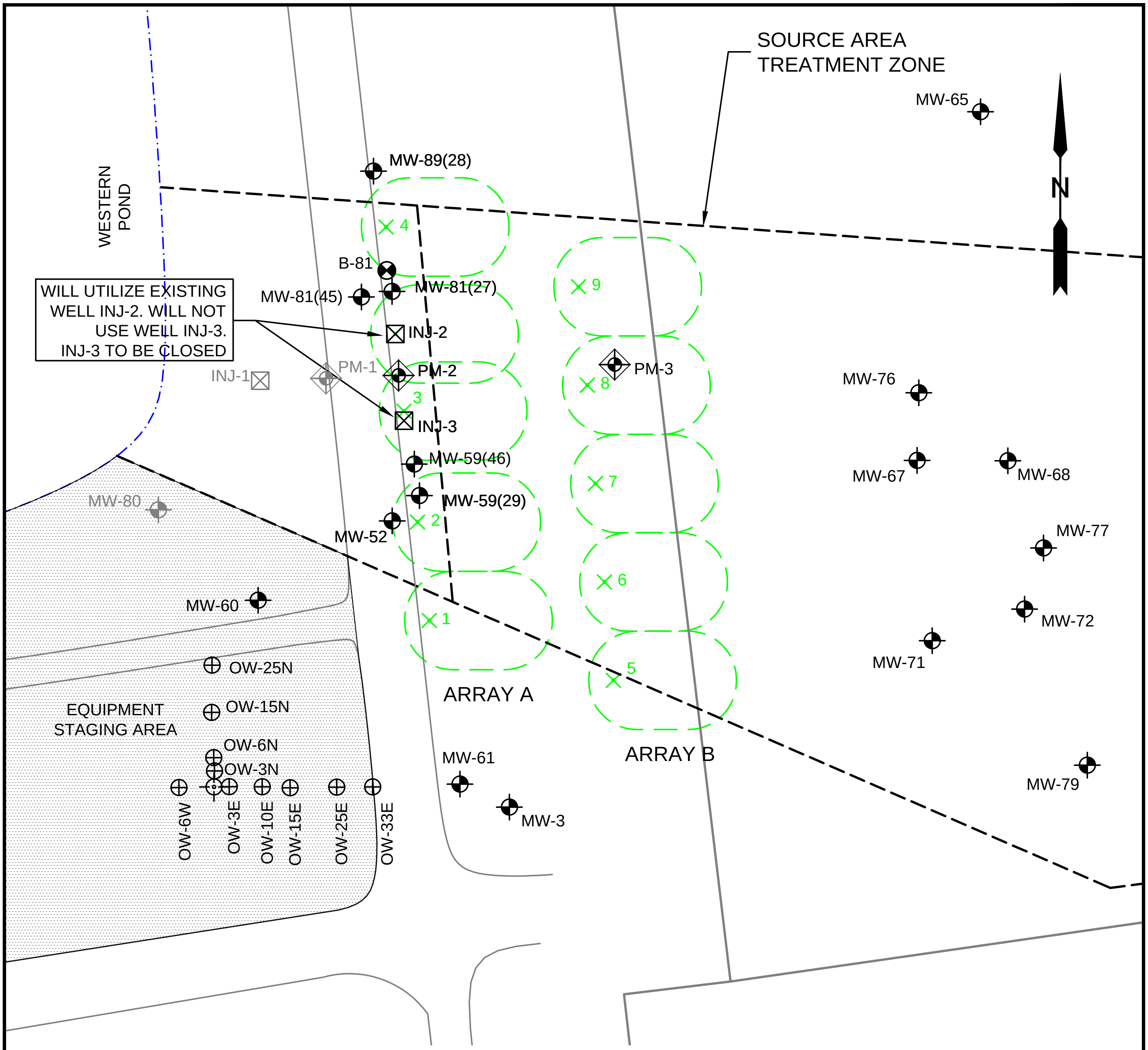

LEGEND

PM-1	◈	PERFORMANCE MONITORING WELL LOCATION
	⌖	TRACER INJECTION WELL LOCATION
OW-3E	⊕	TEST OBSERVATION WELL LOCATION
INJ-1	☒	BIOSTIMULATION PILOT INJECTION WELL LOCATION
B-87	⊗	SOIL BORING LOCATION OVERBURDEN
MW-28	⊕	MONITORING WELL LOCATION
	✕	SHALLOW REMEDIAL ERD INJECTION WELL
	⬭	INFERRED AREA OF INFLUENCE

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CLIENT:
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4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:

SOURCE AREA UPPER INTERVAL WELLS

REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: JP	DATE: 9/16/2013	DWG NO. C104 REV. A
SCALE: 0 30'		FIGURE. NO.: 8.4

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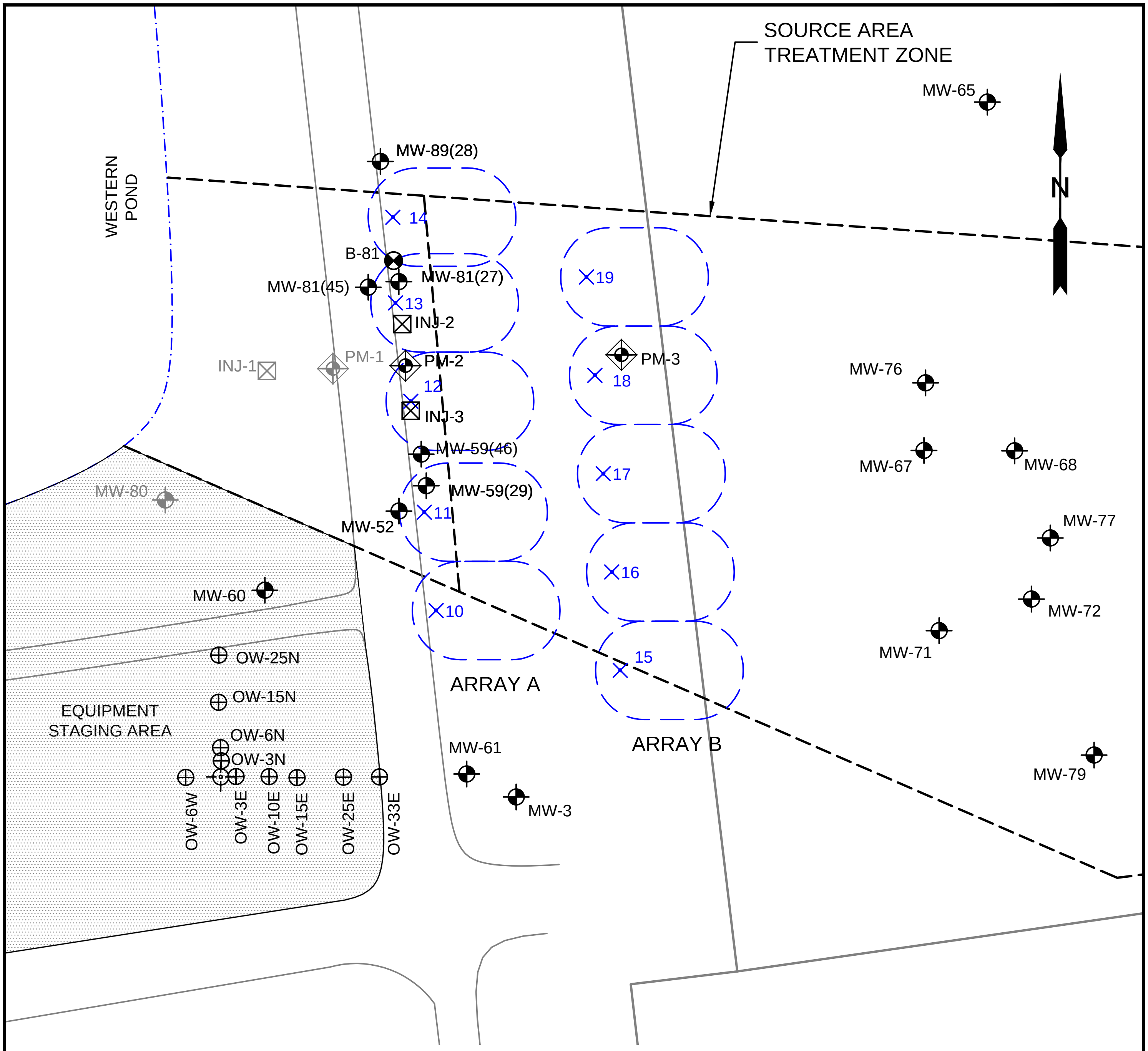

LEGEND

PM-1	◈	PERFORMANCE MONITORING WELL LOCATION
	⌖	TRACER INJECTION WELL LOCATION
OW-3E	⊕	TEST OBSERVATION WELL LOCATION
INJ-1	⊠	BIOSTIMULATION PILOT INJECTION WELL LOCATION
B-87	●	SOIL BORING LOCATION OVERBURDEN
MW-28	⊕	MONITORING WELL LOCATION
	✕	DEEP REMEDIAL ERD INJECTION WELL
	▭	INFERRED AREA OF INFLUENCE

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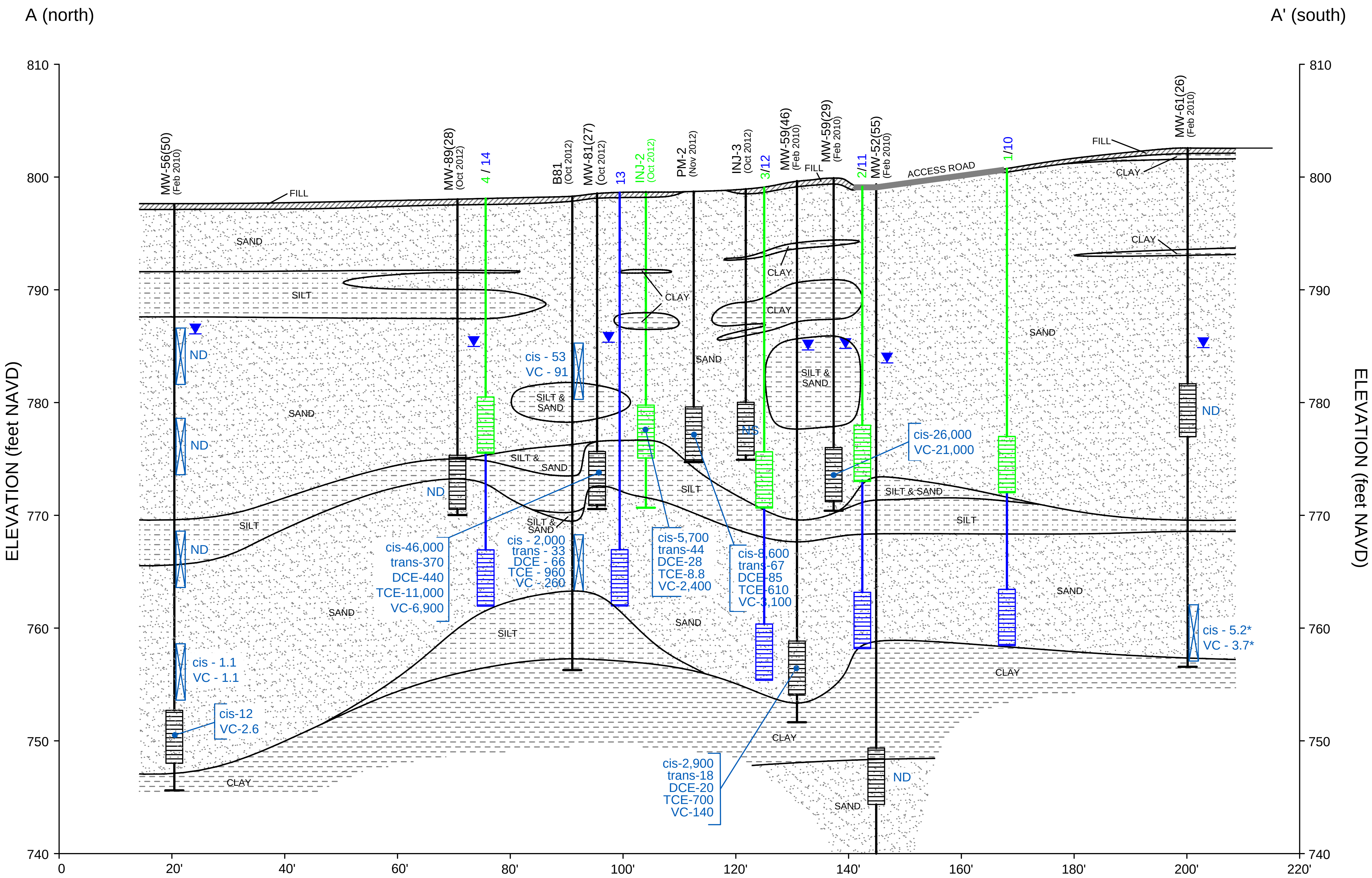
CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
SOURCE AREA
LOWER INTERVAL WELLS
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: JP	DATE: 9/16/2013	DWG NO. C105 REV. A
SCALE: 0 30'		FIGURE. NO.: 8.5

P:\CADD\Projects\3359\3359122618\Task 08\F 08-05 Source Area Lower Interval Inj Wells_01.dwg Jun. 17, 2014 paul.troxel



Horizontal Scale (in feet)
Vertical Exaggeration: 1:2
North American Vertical Datum 1988 (NAVD 88)

LEGEND:

▼ Depth to Water (April/May 2013)

▤ Upper Interval Injection Well Screen

▤ Lower Interval Injection Well Screen

▤ Monitoring Well Screen

MW-56 (Feb 2010) Well Location & Date Installed

VC-11 Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (µg/L)

ND ☒ Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (µg/L)

cis - 5.2* ☒ Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (µg/L)

NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride
ND - Site-related VOCs not detected greater than detection limits.
NAVD 88 - North American Datum 1988

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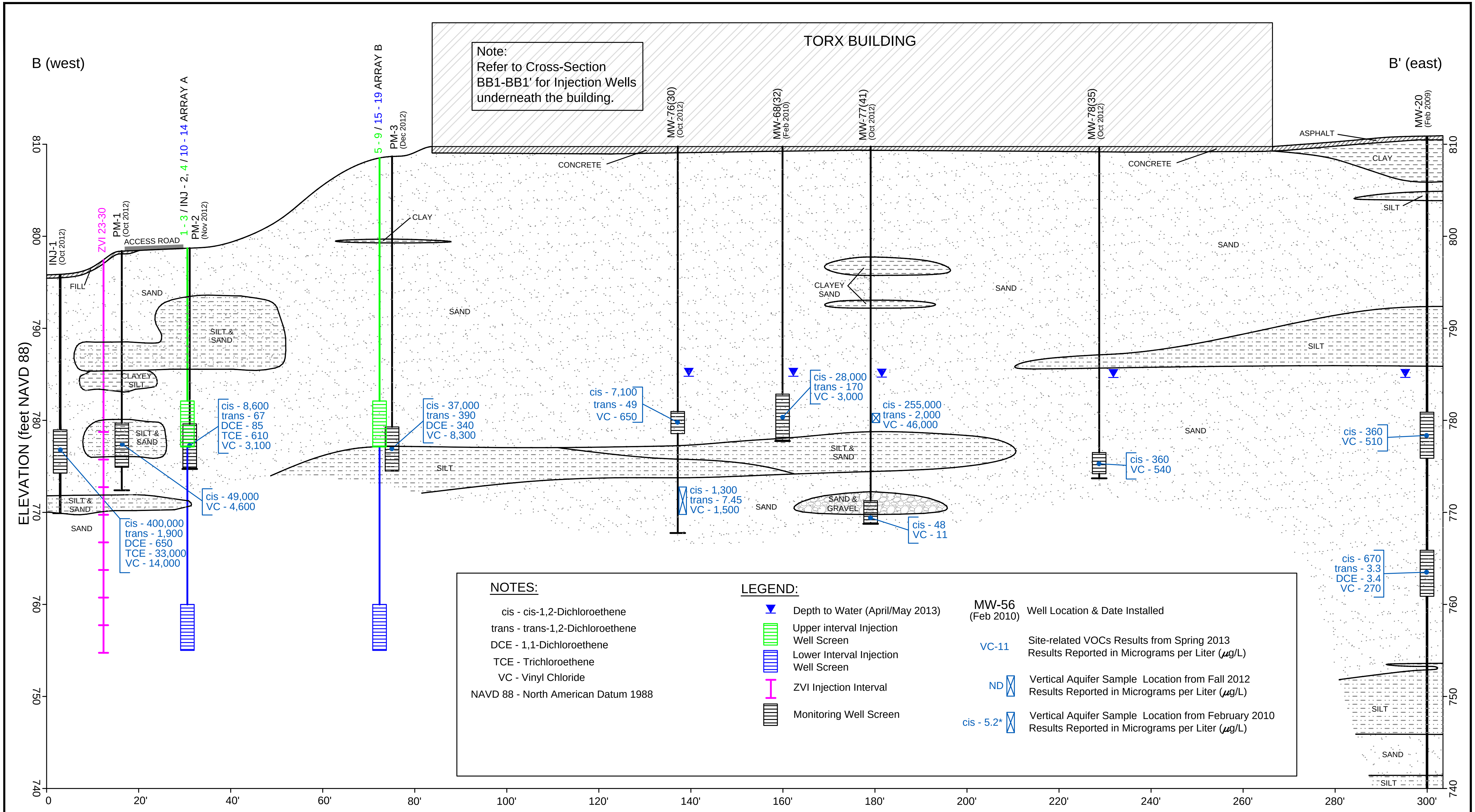
CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
INJECTION WELL CROSS SECTION A-A'
NORTH TO SOUTH
SOURCE AREA
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C106 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.6

P:\CADD\Projects\3359\3359122618\Task 08\F 08-06 Cross Section A.dwg Jun. 17, 2014 paul.troxel



NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride
NAVD 88 - North American Datum 1988

LEGEND:

▼	Depth to Water (April/May 2013)
🟩	Upper interval Injection Well Screen
🟦	Lower Interval Injection Well Screen
I	ZVI Injection Interval
▤	Monitoring Well Screen
MW-56 (Feb 2010)	Well Location & Date Installed
VC-11	Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (μg/L)
ND ☒	Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (μg/L)
cis - 5.2* ☒	Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (μg/L)

Horizontal Scale (in feet)
Vertical Exaggeration: 1:2
North American Vertical Datum 1988 (NAVD 88)

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CLIENT:
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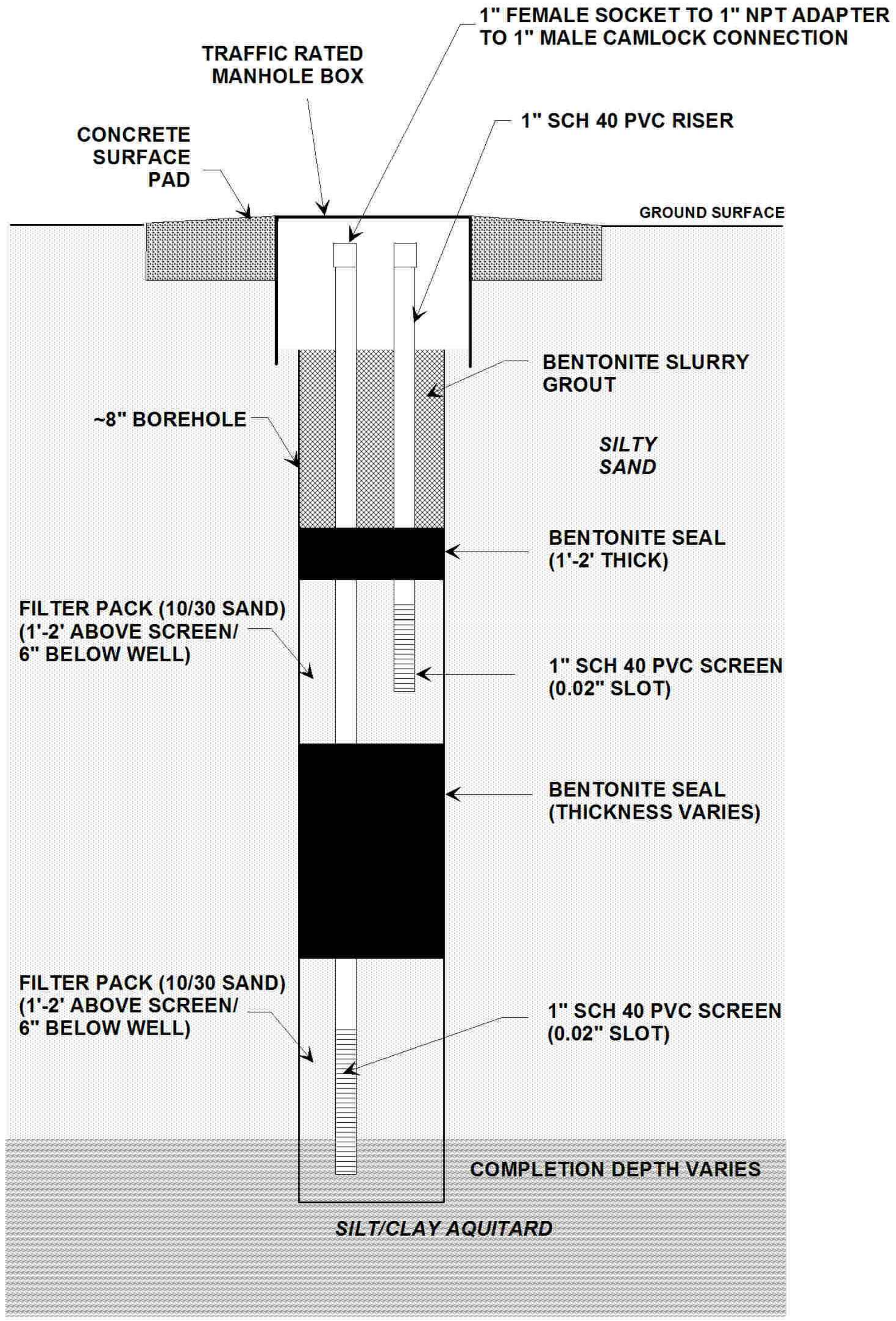
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
INJECTION WELL CROSS SECTION B-B'
WEST TO EAST
SOURCE AREA
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

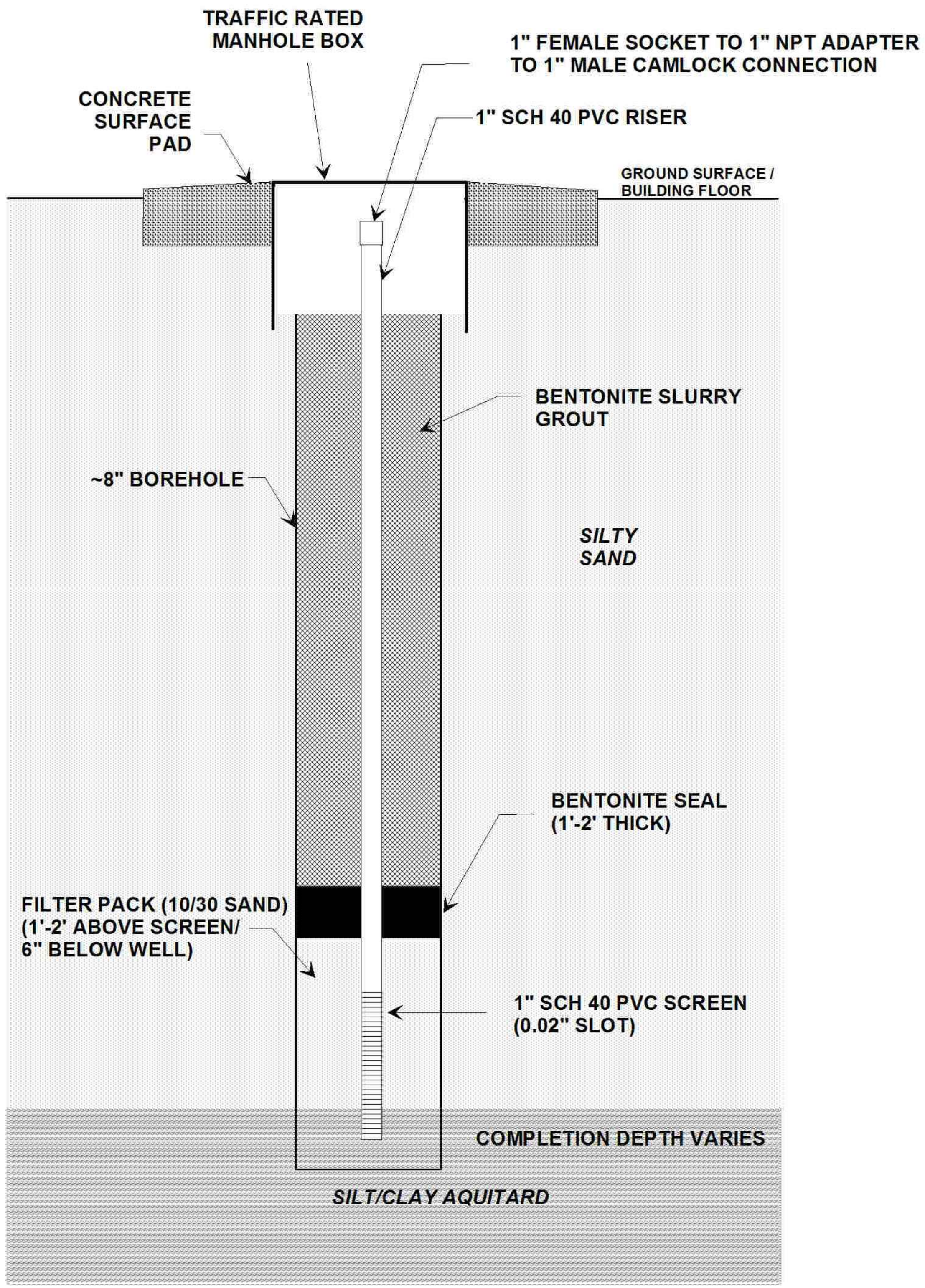
DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C107 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.7

P:\CADD\Projects\3359\3359122618\Task 08\F 08-07 Cross Section B.dwg Jun. 17, 2014 paul.troxel

TYPICAL INJECTION WELL
SOURCE AREA - NESTED



TYPICAL INJECTION WELL
SOURCE AREA - SINGLE



NOTE: INJECTION WELLS INSTALLED WITHIN THE BUILDING
WILL BE FLUSH WITH THE EXISTING FLOOR.

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CLIENT:
TORX FACILITY
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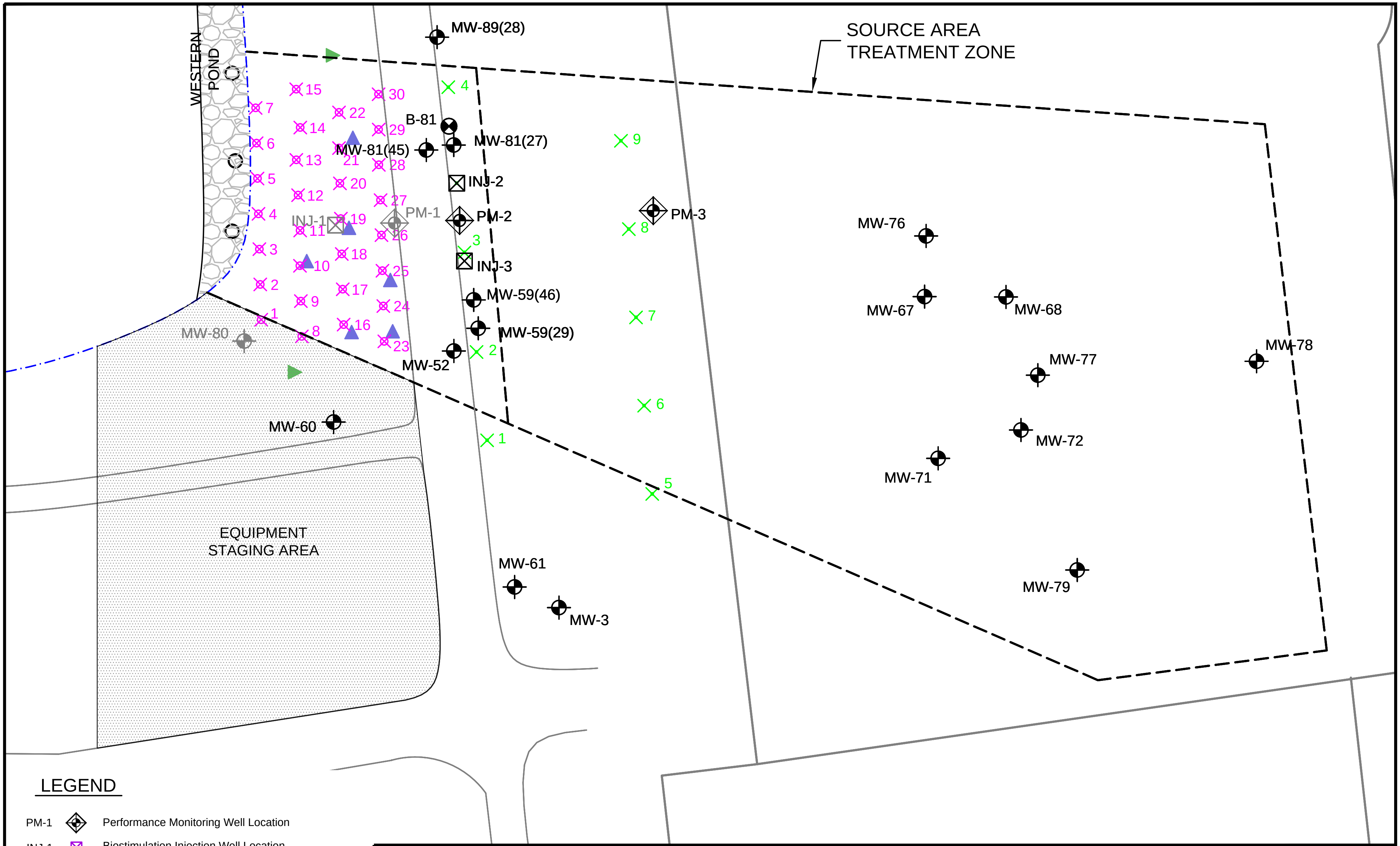
ROCHESTER, INDIANA

TITLE:
TYPICAL INJECTION WELL DETAILS
SOURCE AREA
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. P101 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.8

P:\CADD\Projects\3359\3359122618\Task 08\F 08-09 Staging and Process Source Area_01.dwg Jun. 17, 2014 paul.troxel



LEGEND

PM-1	⯐	Performance Monitoring Well Location
INJ-1	☒	Biostimulation Injection Well Location
B-87	●	Soil Boring Location
MW-28	⊕	Overburden Monitoring Well Location
	×	ABC + Injection Points
	▶	Background HPT/EC Location
	▲	Injection Monitoring HPT/EC Location
	○	Pond Monitoring Location
	×	Shallow Remedial ERD Injection Wells Deep Remedial ERD Injection Wells

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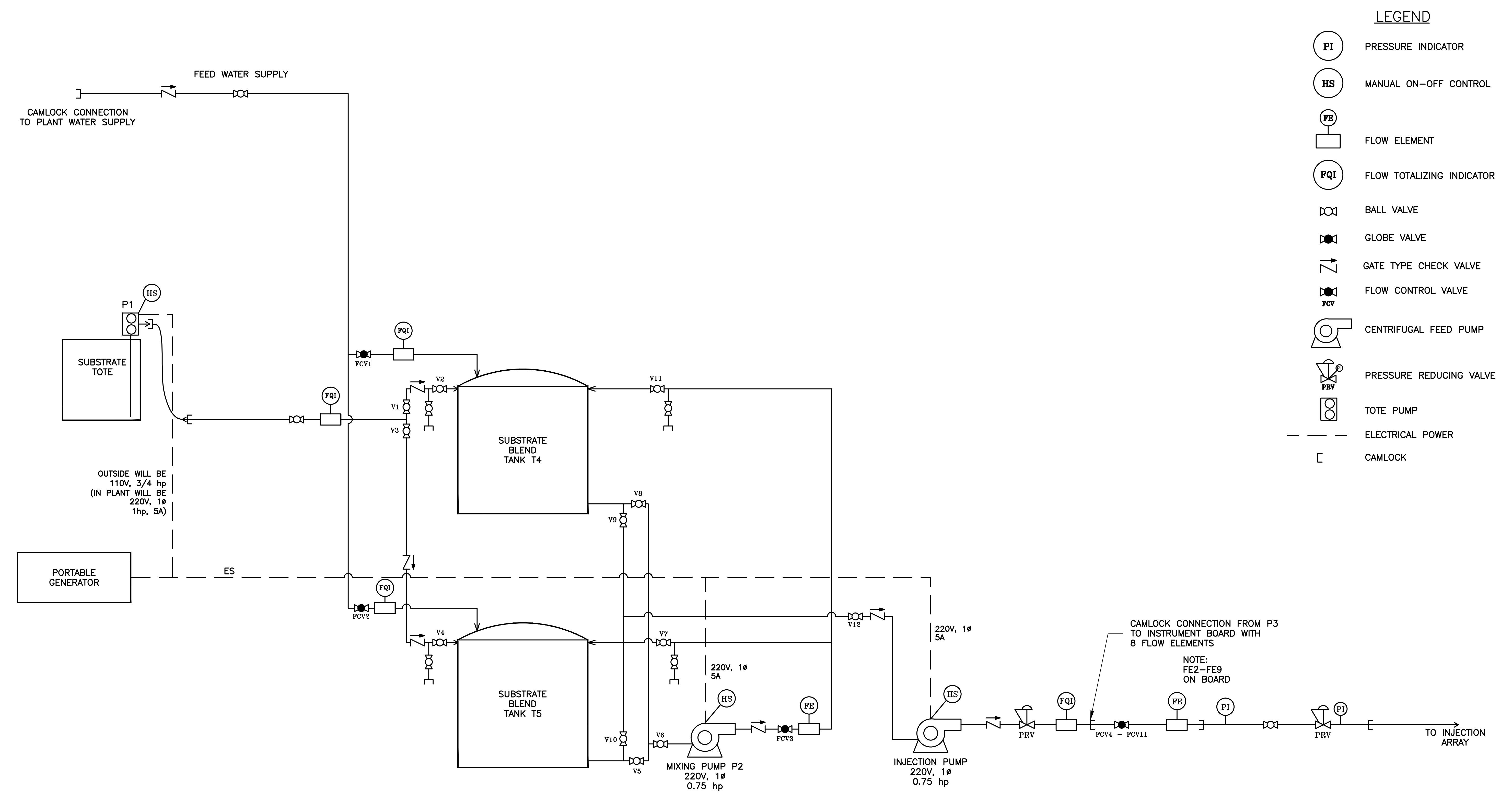
CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
STAGING AND PROCESS SETUP FOR ERD
SOURCE AREA - BEHIND BUILDING
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW
REV: WPT
PROJ. NO.: 3359122618.17.08
CHK: WPT
DATE: 9/16/2013
DWG NO.: C108 REV. A
SCALE: 0 30'
FIGURE. NO.: 8.9



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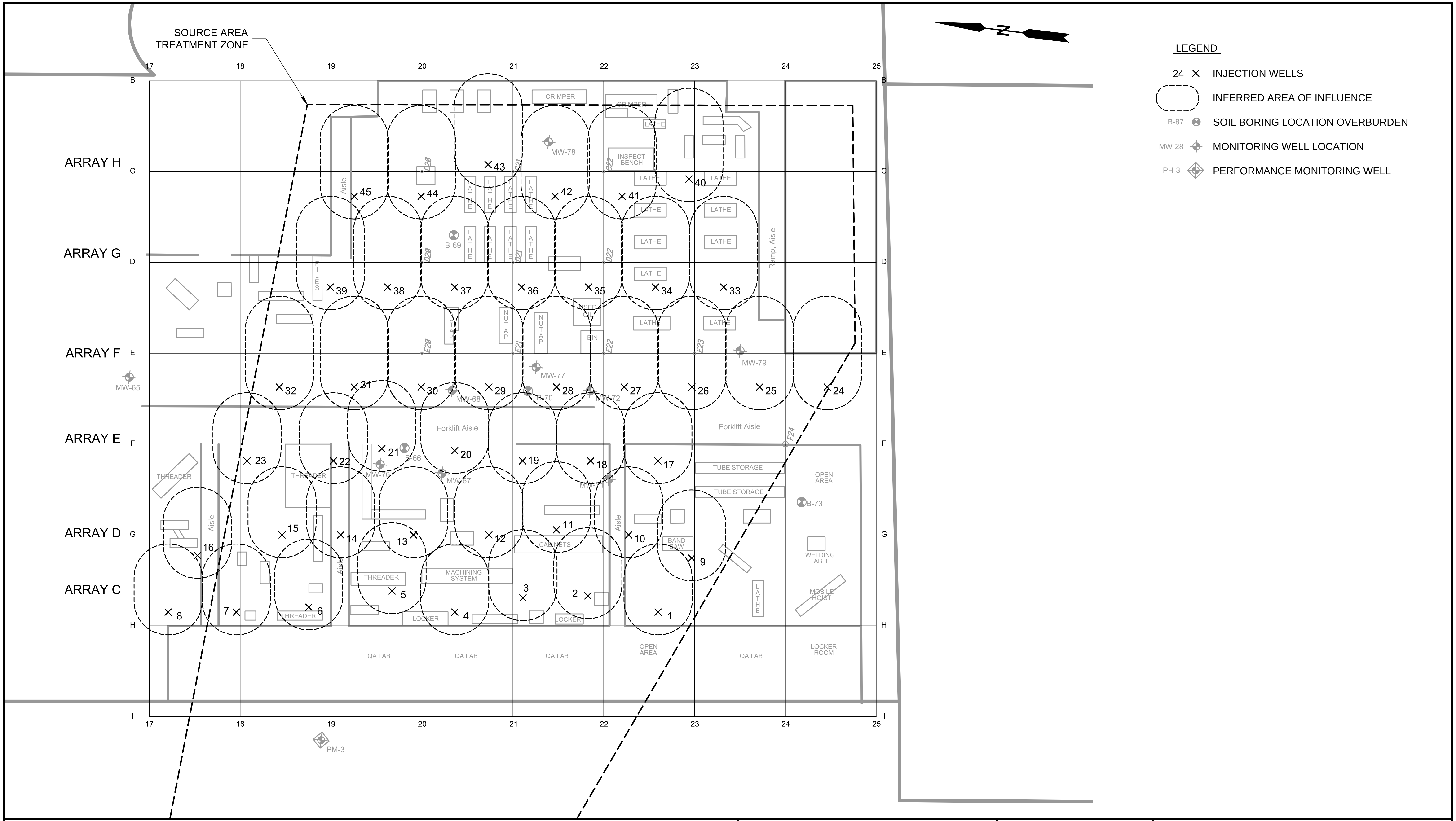
CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
PROCESS EQUIPMENT SCHEMATIC
FOR PRODUCT ABC
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C103 REV. A
SCALE:	AS SHOWN	FIGURE. NO.: 8.10

P:\CADD\Projects\3359\3359122618\Task 08\F 08-10 Process Equipment Schematic.dwg Jun. 17, 2014 paul.troxel



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NOTES:

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CLIENT:
TORX FACILITY
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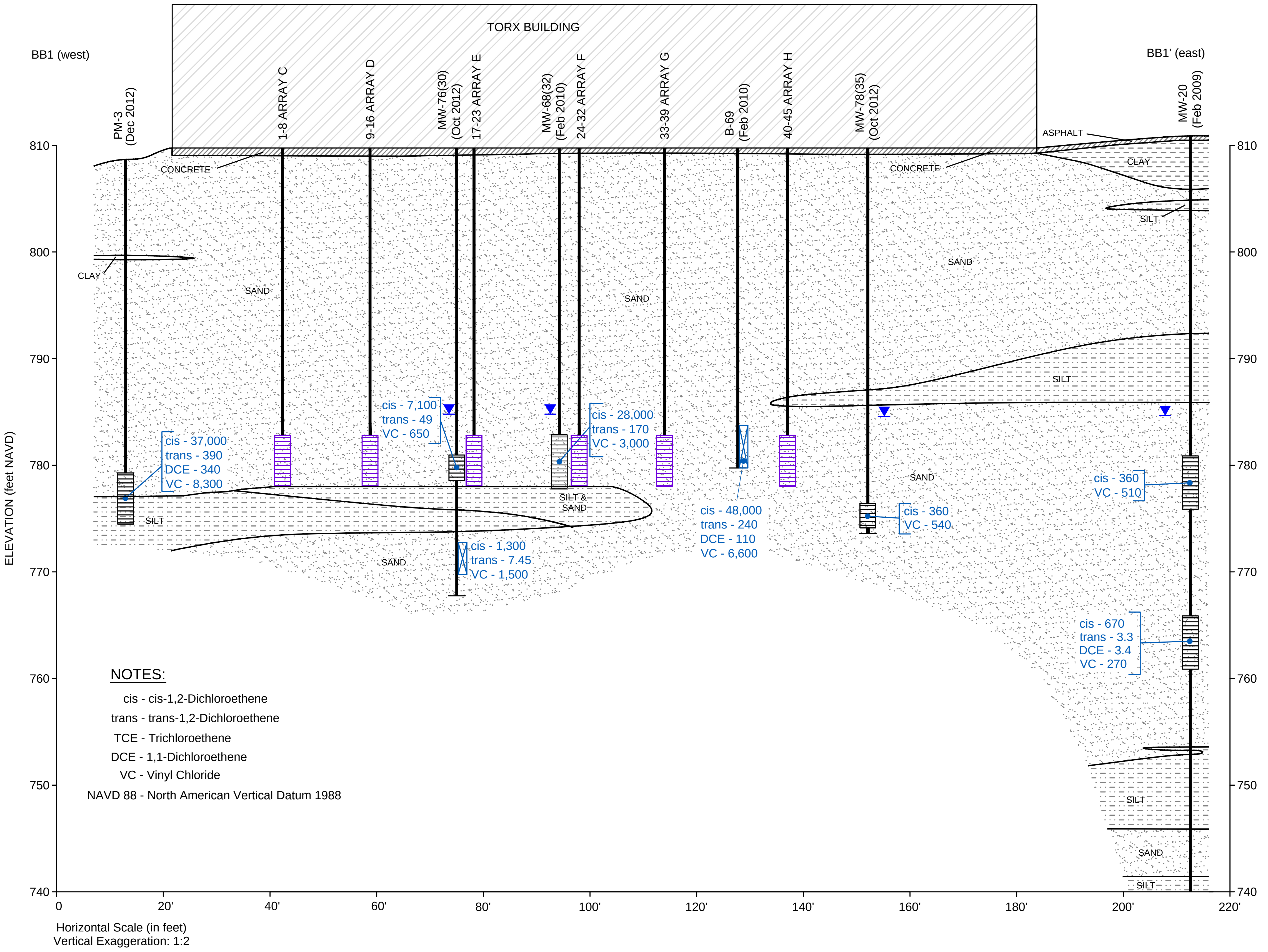
ROCHESTER, INDIANA

TITLE:
INJECTION WELL LOCATIONS
SOURCE AREA - BUILDING TREATMENT ZONE
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 09-17-2013	DWG NO. C109 REV. A
SCALE: 0 20'		FIGURE. NO.: 8.11

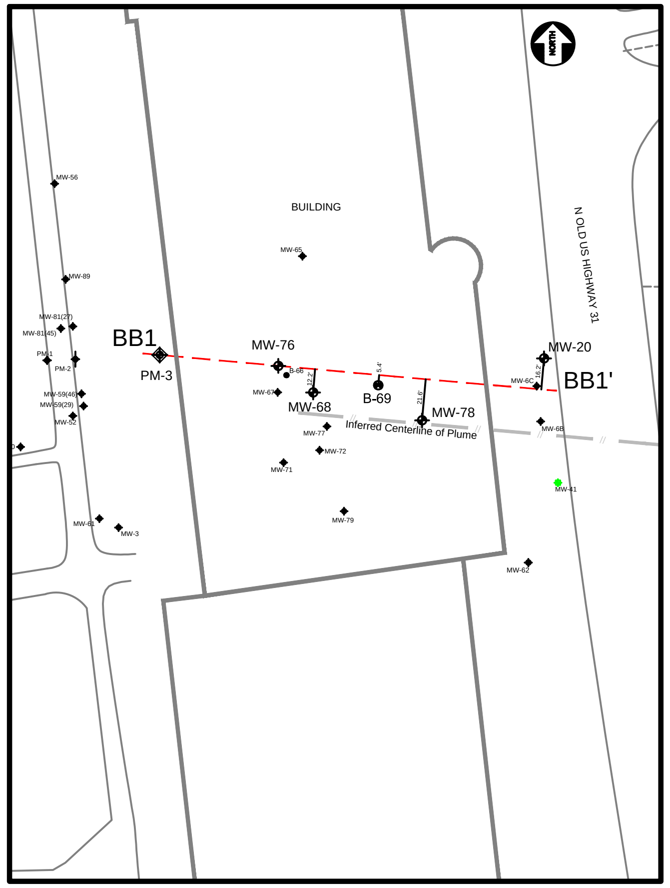
LEGEND:

- ▼ Depth to Water (April/May 2013)
- ▤ Injection Well Screen
- ▤ Monitoring Well Screen
- MW-56 (Feb 2010) Well Location & Date Installed
- VC-11 Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (μg/L)
- ND ☒ Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (μg/L)
- cis - 5.2* ☒ Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (μg/L)



NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride
NAVD 88 - North American Vertical Datum 1988



PROJECTED CROSS SECTION LOCATION

0' 50' 100' 150'
1" = 100'

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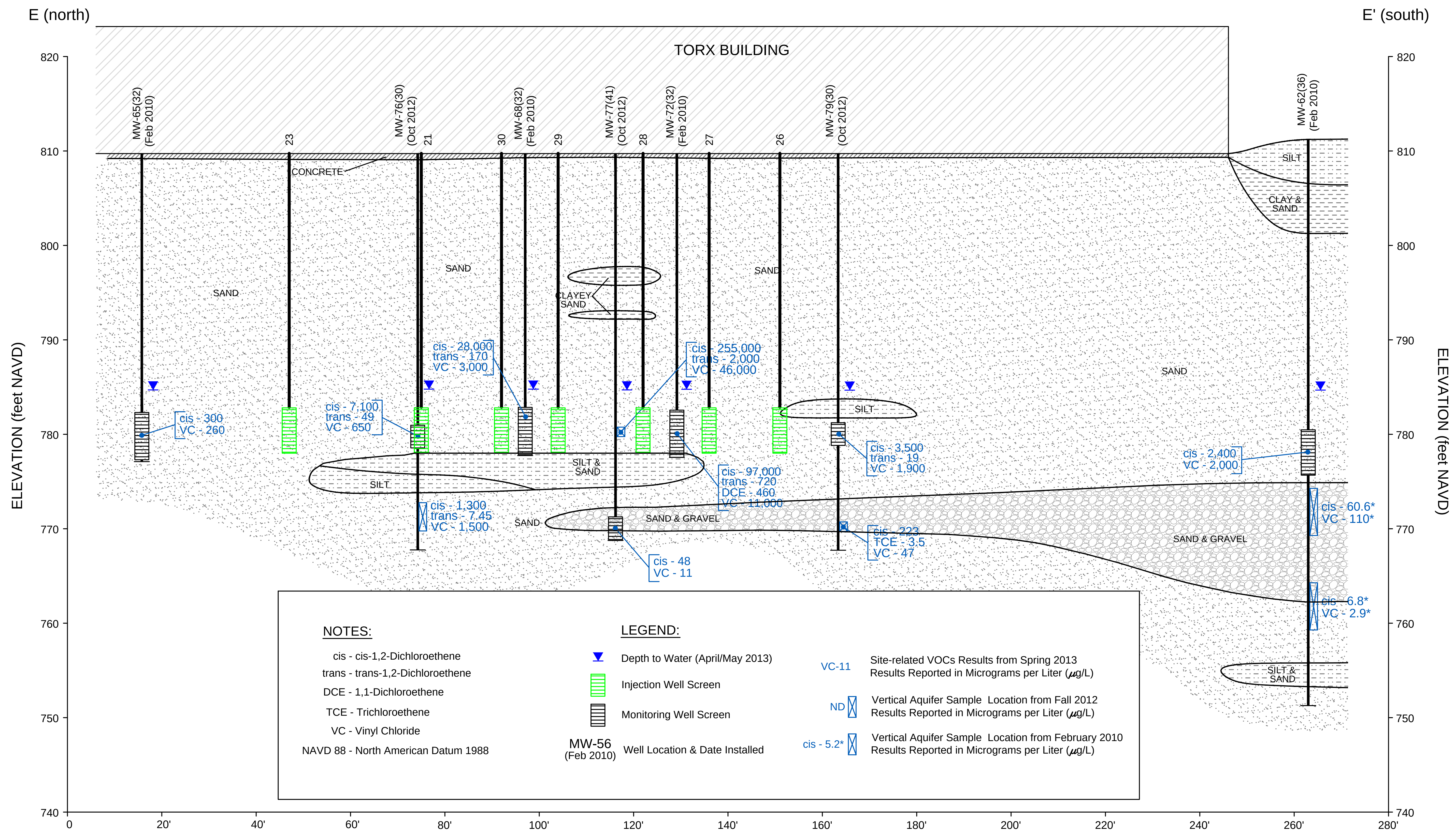
CLIENT: TORX FACILITY 4366 NORTH OLD US HIGHWAY 31 ROCHESTER, INDIANA		
DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C-110 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.12

TITLE:
INJECTION WELL CROSS SECTION
WEST TO EAST
UNDER BUILDING
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

P:\CADD\Projects\3359\3359122618\Task 08\F 08-12 Cross Section BB1.dwg Jun. 17, 2014 paul.troxel



NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride
NAVD 88 - North American Datum 1988

LEGEND:

▼	Depth to Water (April/May 2013)
🟩	Injection Well Screen
▤	Monitoring Well Screen
MW-56 (Feb 2010)	Well Location & Date Installed
VC-11	Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (µg/L)
ND ☒	Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (µg/L)
cis - 5.2* ☒	Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (µg/L)

Horizontal Scale (in feet)
Vertical Exaggeration: 1:2
North American Vertical Datum 1988 (NAVD 88)

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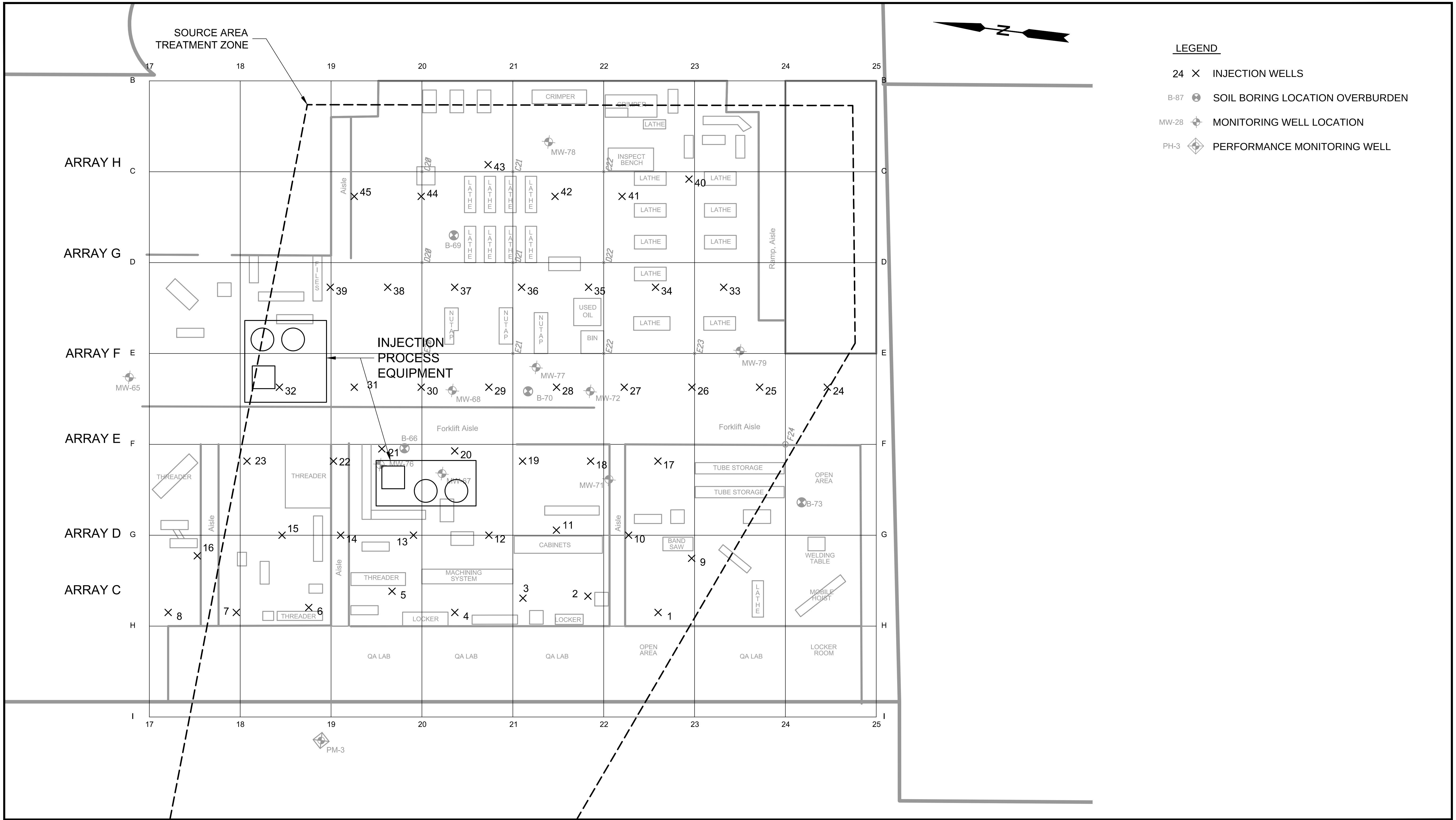
CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
INJECTION WELL CROSS SECTION E-E'
NORTH TO SOUTH
UNDER BUILDING
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C111 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.13

P:\CADD\Projects\3359\3359122618\Task 08\F 08-13 Cross Section E.dwg Jun. 17, 2014 paul.troxel



NOTES:

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CLIENT:
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

TITLE:
INJECTION PROCESS EQUIPMENT LOCATIONS
SOURCE AREA - BUILDING TREATMENT ZONE
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 09-17-2013	DWG NO. C112 REV. A
SCALE: 0 20'		FIGURE. NO.: 8.14

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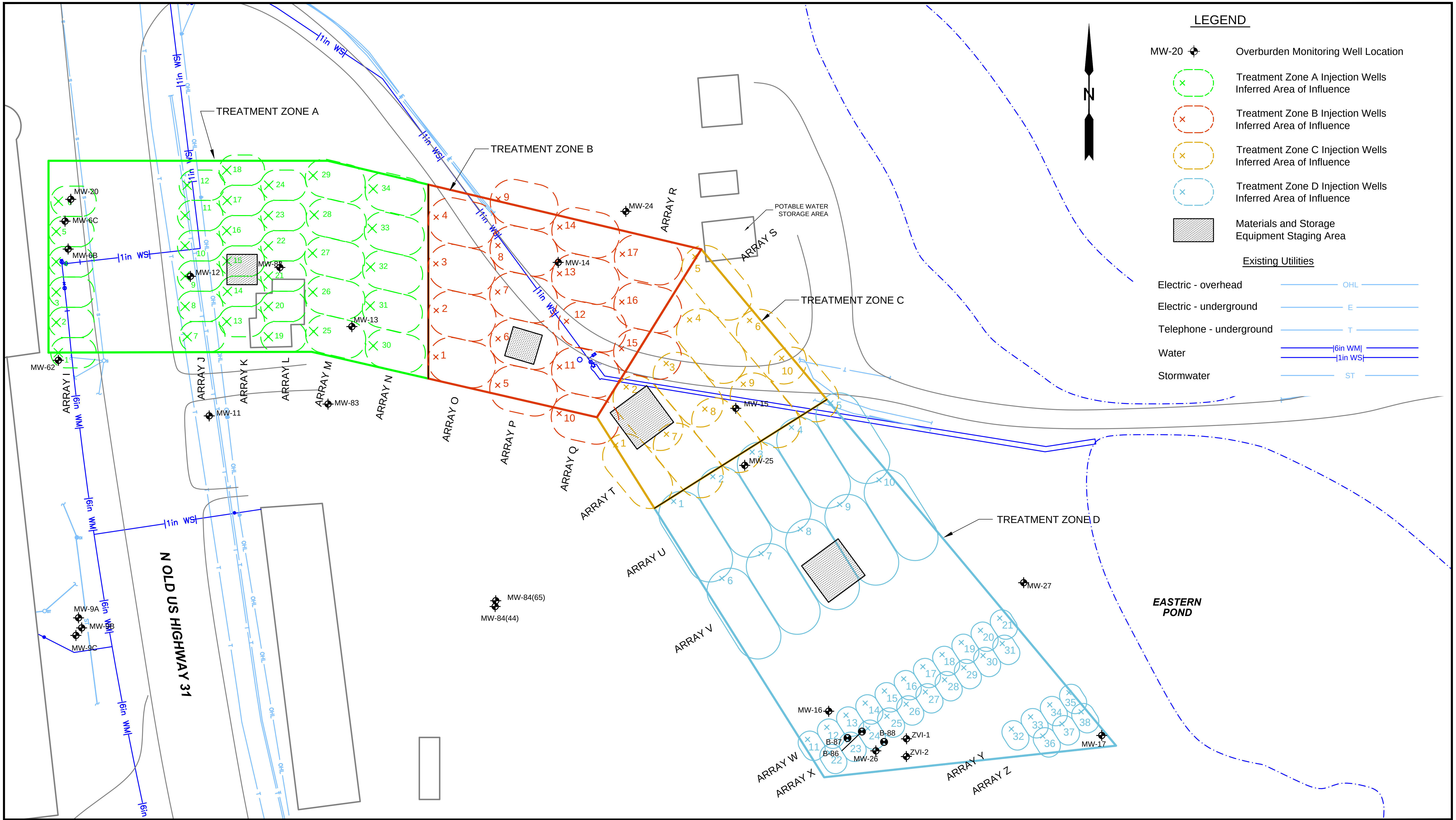

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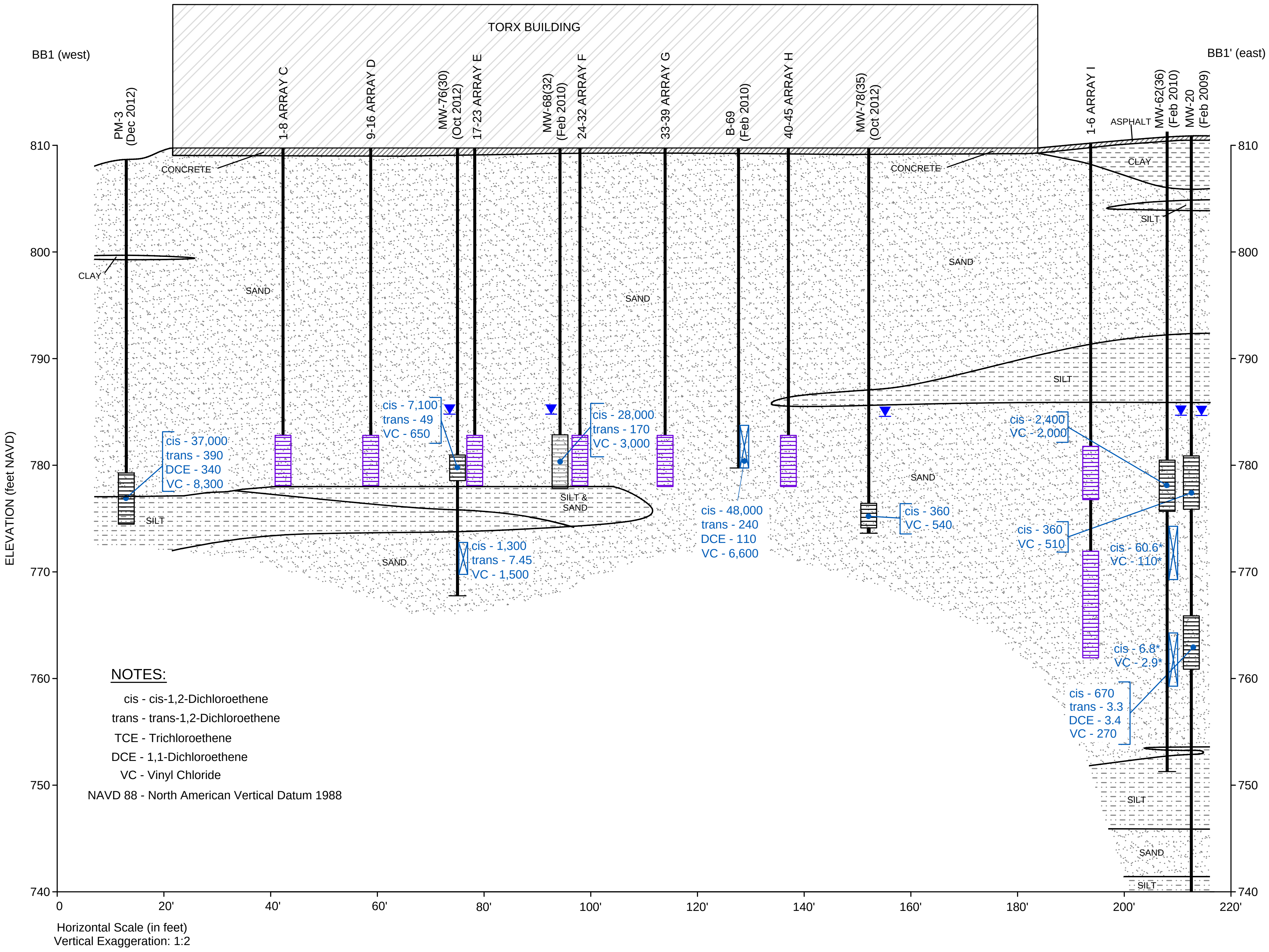
ROCHESTER, INDIANA

TITLE:
INJECTION WELL LOCATIONS
TREATMENT ZONES A, B, C, and D
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 09-17-2013	DWG NO. C113 REV. B
SCALE: 0 60'		FIGURE. NO.: 8.15

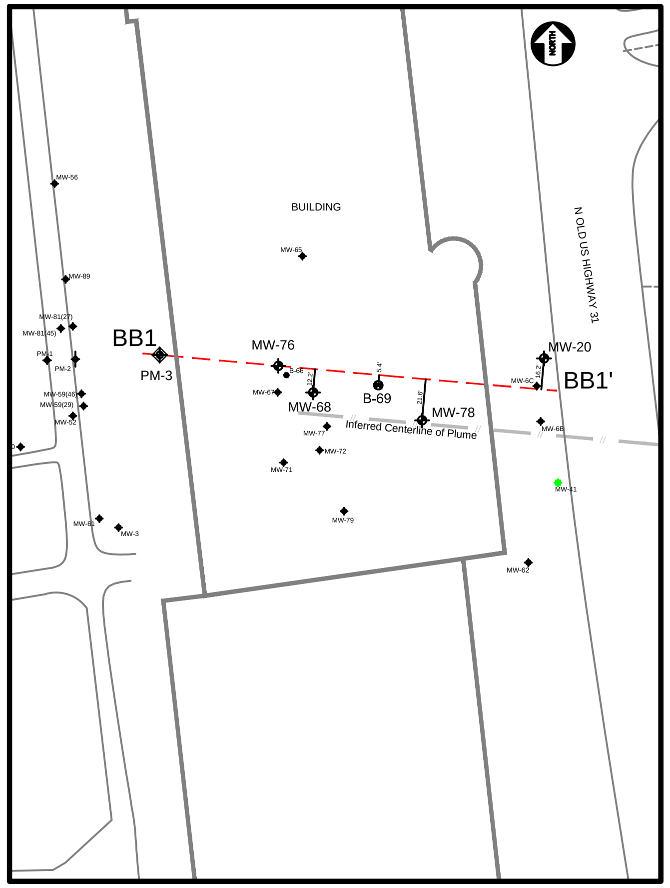
LEGEND:

▼	Depth to Water (April/May 2013)
▤	Injection Well Screen
▤	Monitoring Well Screen
MW-56 (Feb 2010)	Well Location & Date Installed
VC-11	Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (μg/L)
ND ☒	Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (μg/L)
cis - 5.2* ☒	Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (μg/L)



NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
TCE - Trichloroethene
DCE - 1,1-Dichloroethene
VC - Vinyl Chloride
NAVD 88 - North American Vertical Datum 1988



PROJECTED CROSS SECTION LOCATION

0' 50' 100' 150'
1" = 100'

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TITLE:
INJECTION WELL CROSS SECTION BB1-BB1'
WEST TO EAST
DOWNGRADIENT TREATMENT ZONE ARRAY I
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C-114 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.16

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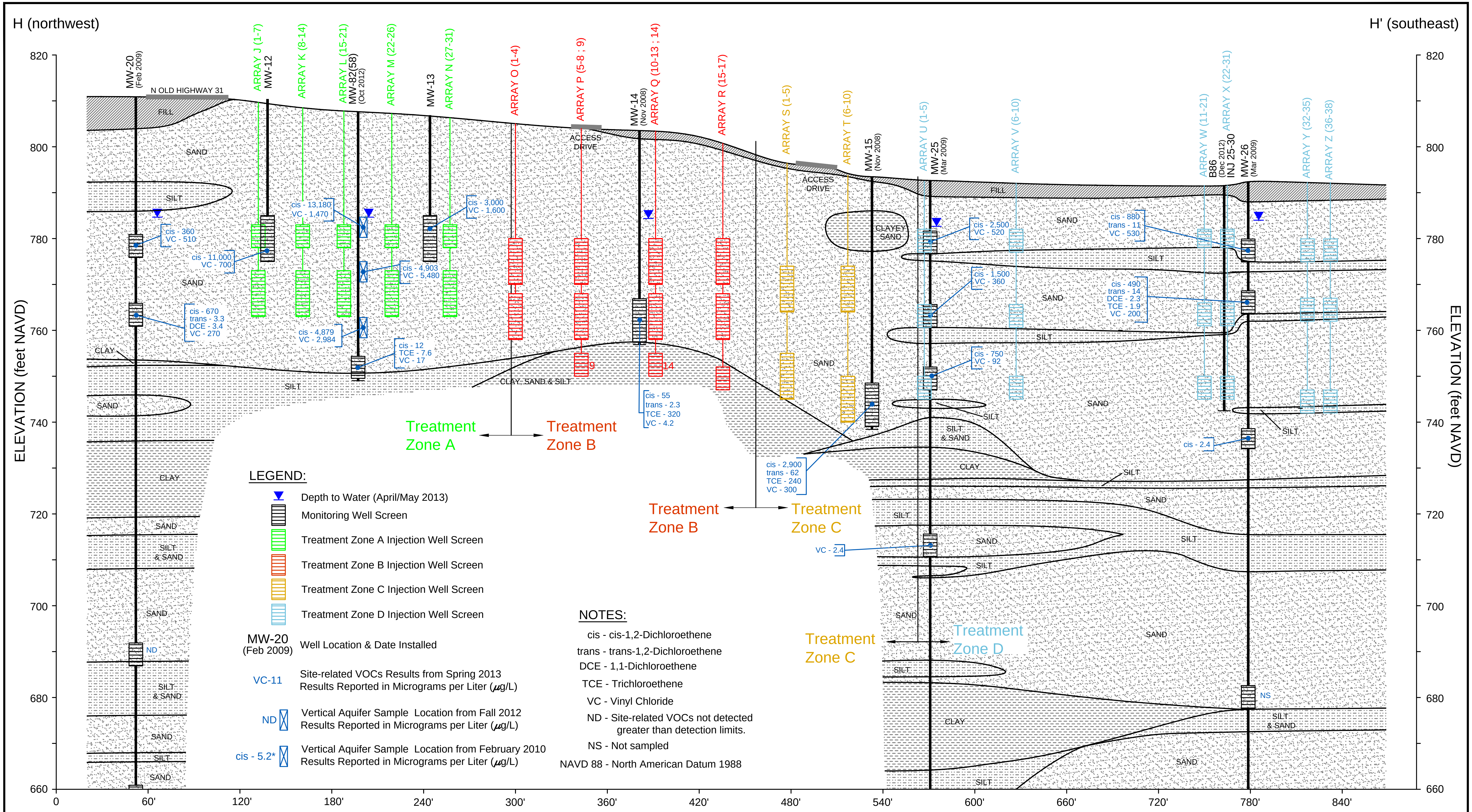

LEGEND:

▼	Depth to Water (April/May 2013)
▤	Monitoring Well Screen
🟩	Treatment Zone A Injection Well Screen
🟥	Treatment Zone B Injection Well Screen
🟨	Treatment Zone C Injection Well Screen
🟦	Treatment Zone D Injection Well Screen
MW-20 (Feb 2009)	Well Location & Date Installed
VC-11	Site-related VOCs Results from Spring 2013 Results Reported in Micrograms per Liter (μg/L)
ND ☒	Vertical Aquifer Sample Location from Fall 2012 Results Reported in Micrograms per Liter (μg/L)
cis - 5.2* ☒	Vertical Aquifer Sample Location from February 2010 Results Reported in Micrograms per Liter (μg/L)

NOTES:

cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
DCE - 1,1-Dichloroethene
TCE - Trichloroethene
VC - Vinyl Chloride
ND - Site-related VOCs not detected greater than detection limits.
NS - Not sampled
NAVD 88 - North American Datum 1988

Horizontal Scale (in feet)
Vertical Exaggeration: 1:2
North American Vertical Datum 1988 (NAVD 88)

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CLIENT:
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TITLE:
INJECTION WELL CROSS SECTION H-H'
NORTHWEST TO SOUTHEAST
TREATMENT ZONES A, B, C, and D
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. C115 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.17

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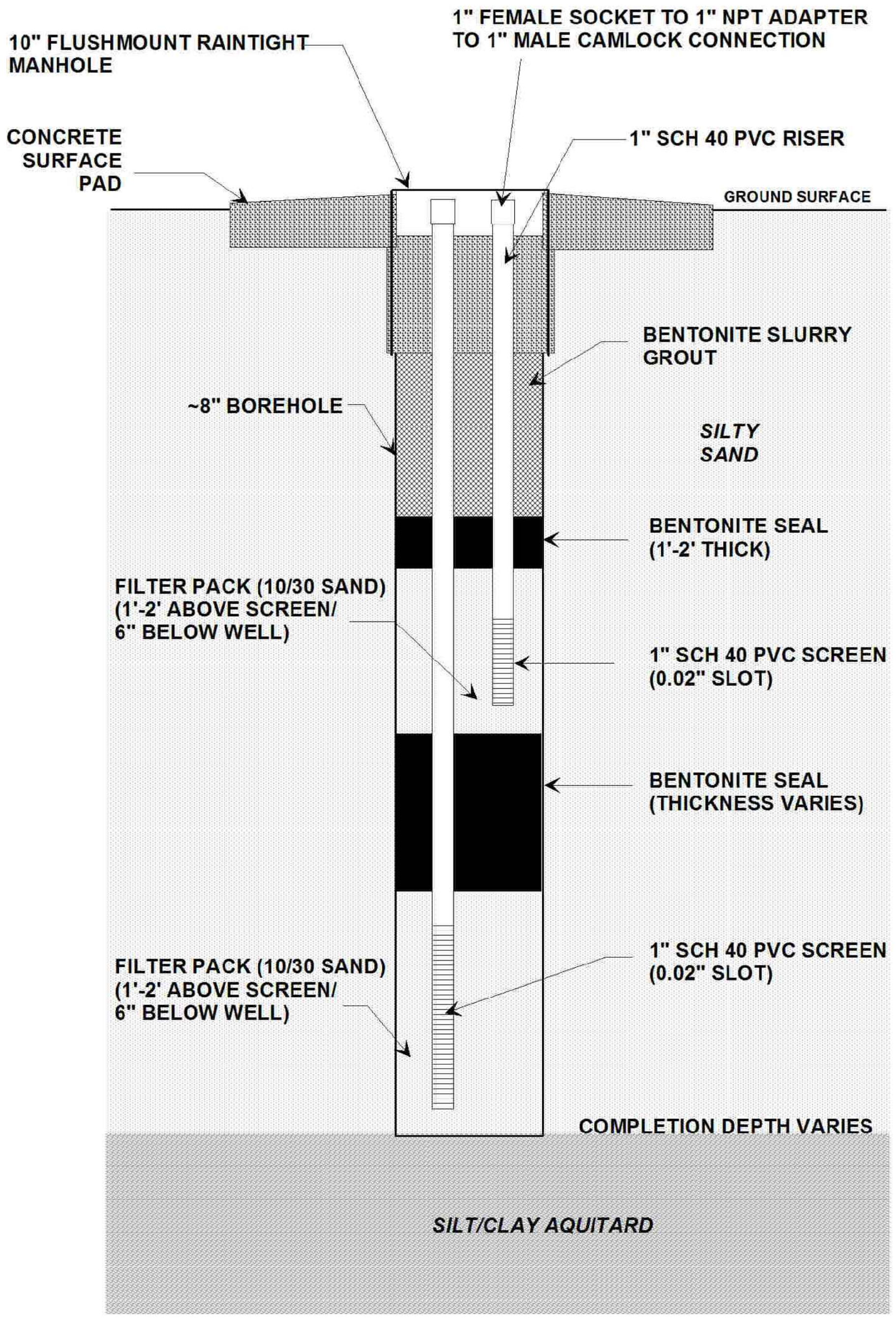
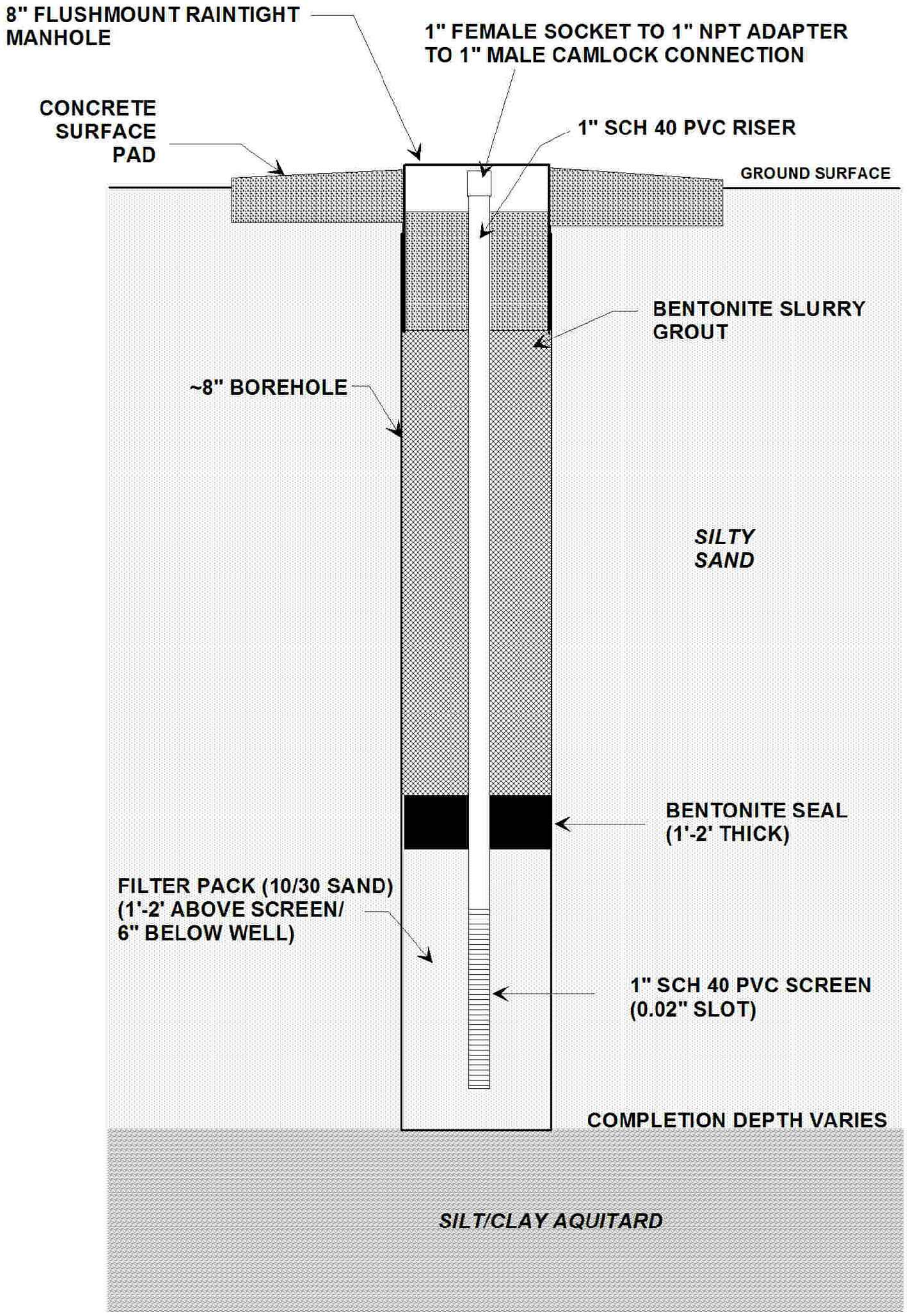
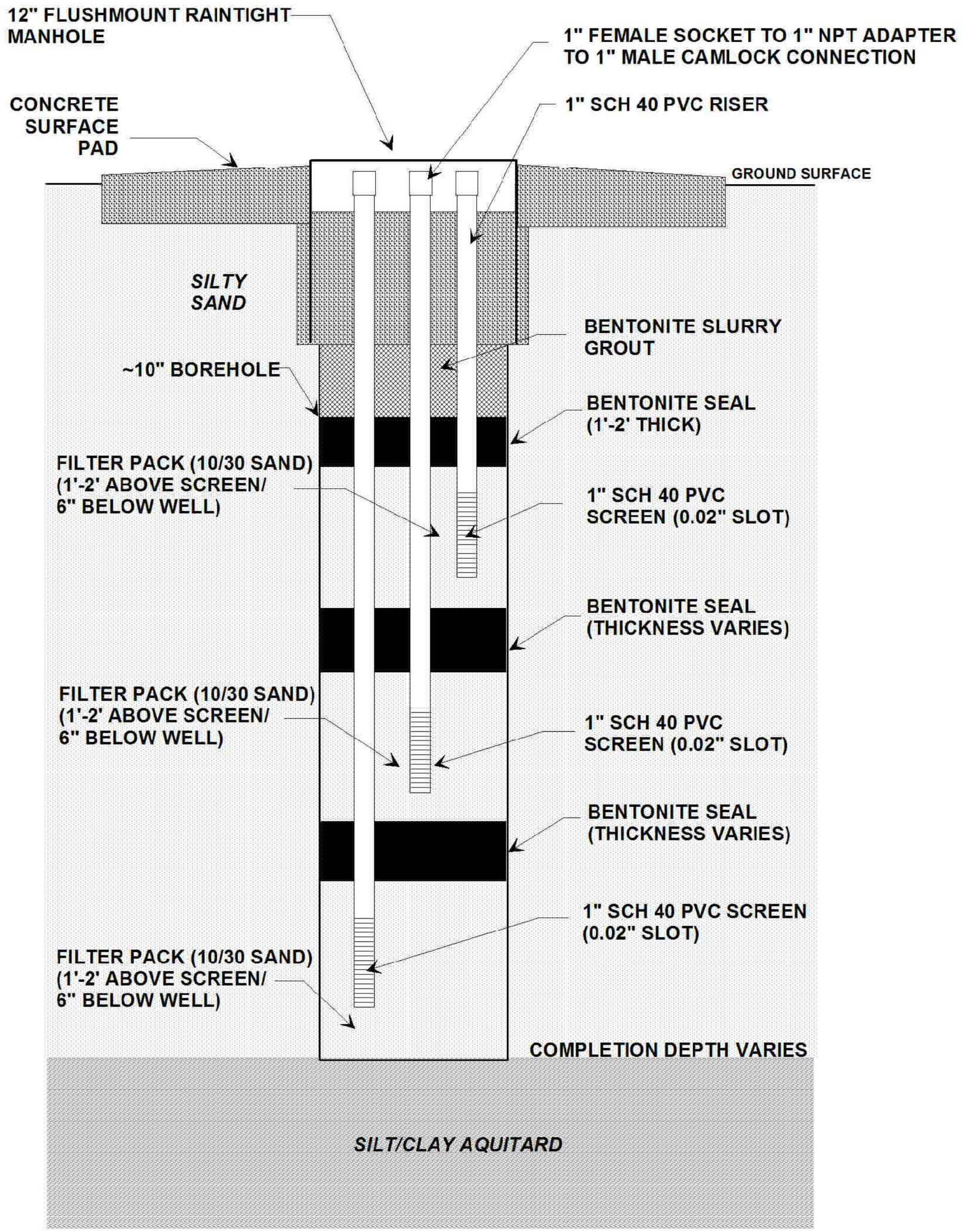
TYPICAL INJECTION WELL TREATMENT ZONES A AND C



TYPICAL INJECTION WELL TREATMENT ZONE B



TYPICAL INJECTION WELL TREATMENT ZONE D



NOTES:

1. IN TREATMENT ZONE B, LOCATIONS 9, 14 AND 15 THROUGH 17 WILL HAVE A THIRD INJECTION WELL FOR A DEEP INTERVAL AT 748 TO 753 FT AMSL THAT WILL BE SCREENED INTO THE SILT/CLAY AQUITARD.

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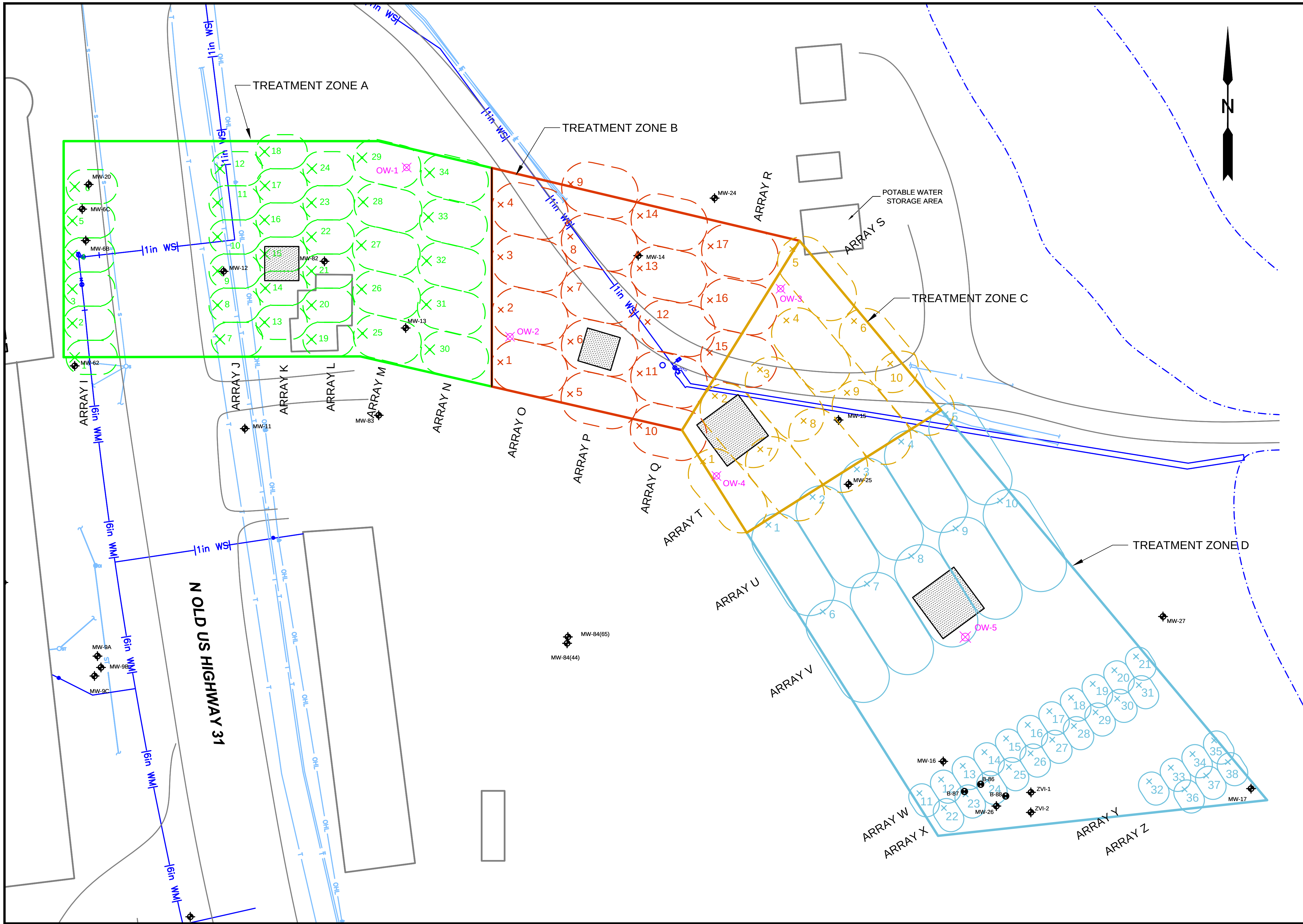
TITLE:
TYPICAL INJECTION WELL DETAILS
TREATMENT ZONES A THROUGH D
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. P103 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.18

P:\CADD\Projects\3359\3359122618\Task 08\F 08-18 Typ Monitoring Well Details.dwg Jun. 17, 2014 paul.troxel



LEGEND

OW-1	☒	Proposed Monitoring Well Location
B-87	●	Soil Boring Location
MW-28	⊕	Overburden Monitoring Well Location
	×	Treatment Zone A Injection Points Inferred Area of Influence
	×	Treatment Zone B Injection Points Inferred Area of Influence
	×	Treatment Zone C Injection Points Inferred Area of Influence
	×	Treatment Zone D Injection Points Inferred Area of Influence
	▨	Materials and Storage Equipment Staging Area

Existing Utilities

Electric - overhead	OHL
Electric - underground	E
Telephone - underground	T
Water	6in WM 1in WS
Stormwater	ST

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CLIENT:
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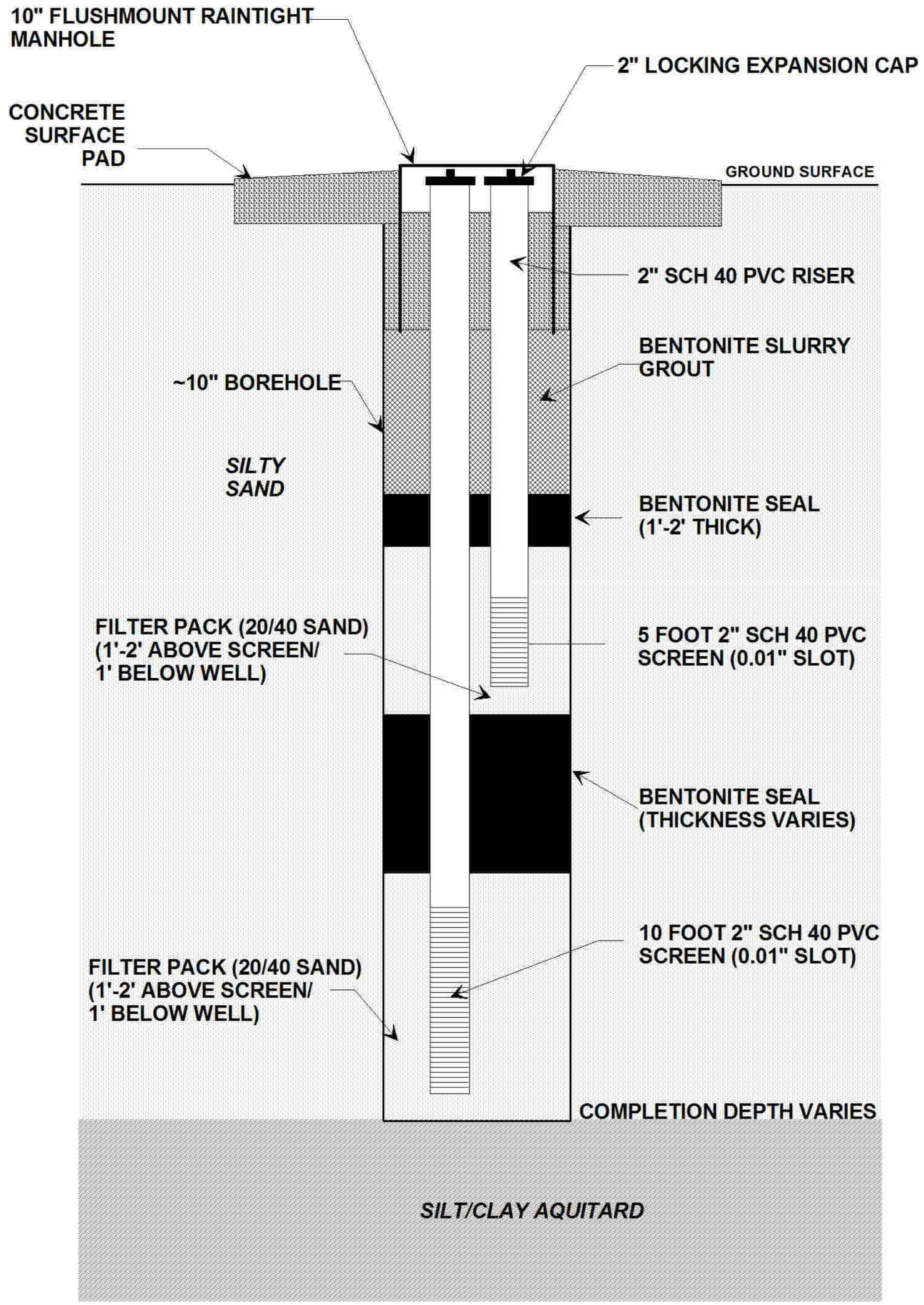
TITLE:
MONITORING WELL LOCATIONS
TREATMENT AREA A, B, C, and D
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: WRW	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 09-17-2013	DWG NO. C116 REV. A
SCALE: 0 60'		FIGURE. NO.: 8.19

P:\CADD\Projects\3359\3359122618\Task 08\F 08-19 Monitoring Well Locations Zones A-D_01.dwg Jun. 17, 2014 paul.troxel

TYPICAL MONITORING WELL
TREATMENT ZONES A THROUGH D



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ROCHESTER, INDIANA

TITLE:
TYPICAL MONITORING WELL DETAIL
TREATMENT ZONES A THROUGH D
REMEDIATION WORK PLAN
TORX FACILITY, ROCHESTER, INDIANA

DR: APT	REV: WPT	PROJ. NO.: 3359122618.17.08
CHK: MJP	DATE: 10-14-2013	DWG NO. P104 REV. A
SCALE: AS SHOWN		FIGURE. NO.: 8.20

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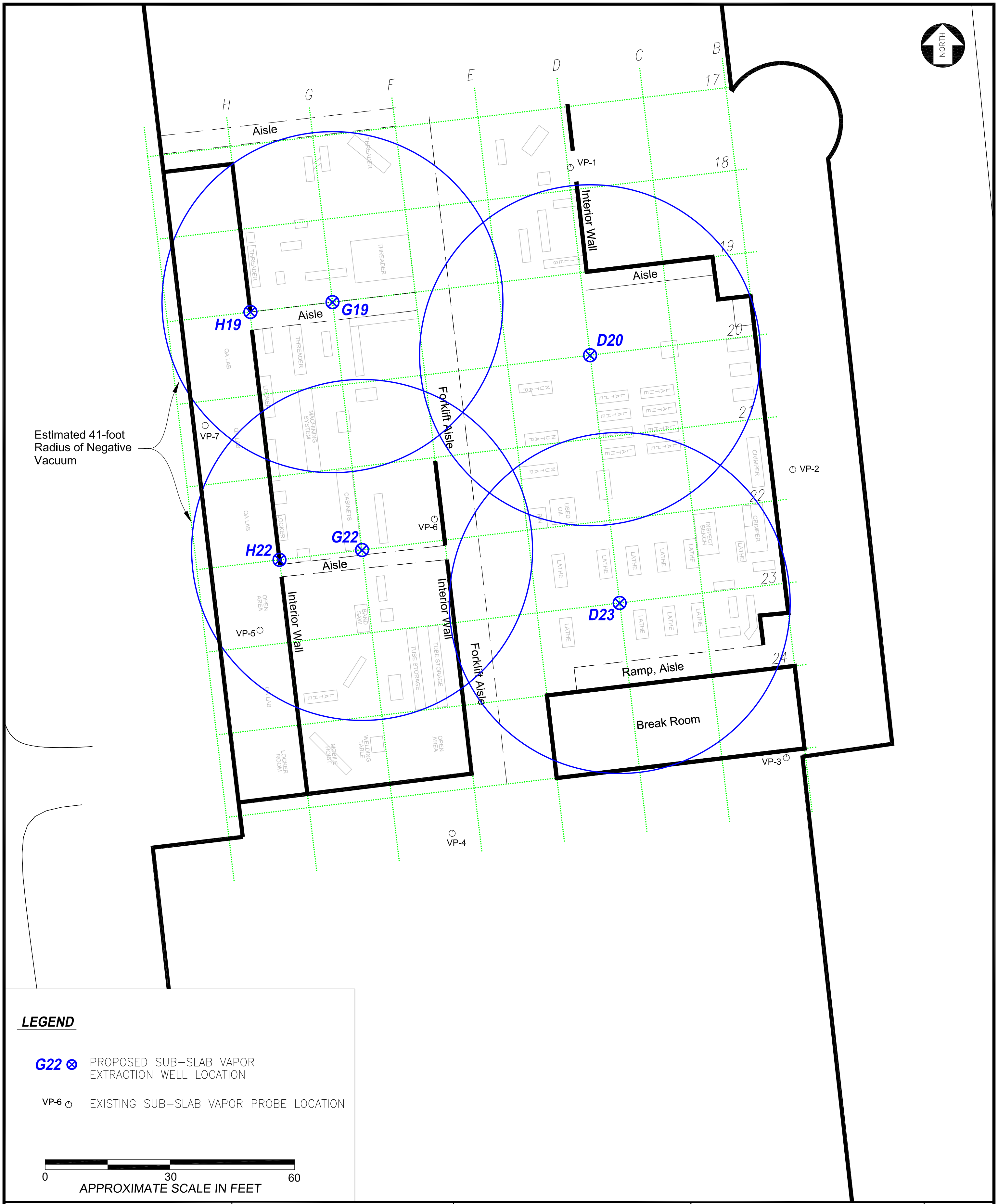

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APPROVED BY PJS	DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005; historical maps from Textron	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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ROCHESTER, INDIANA

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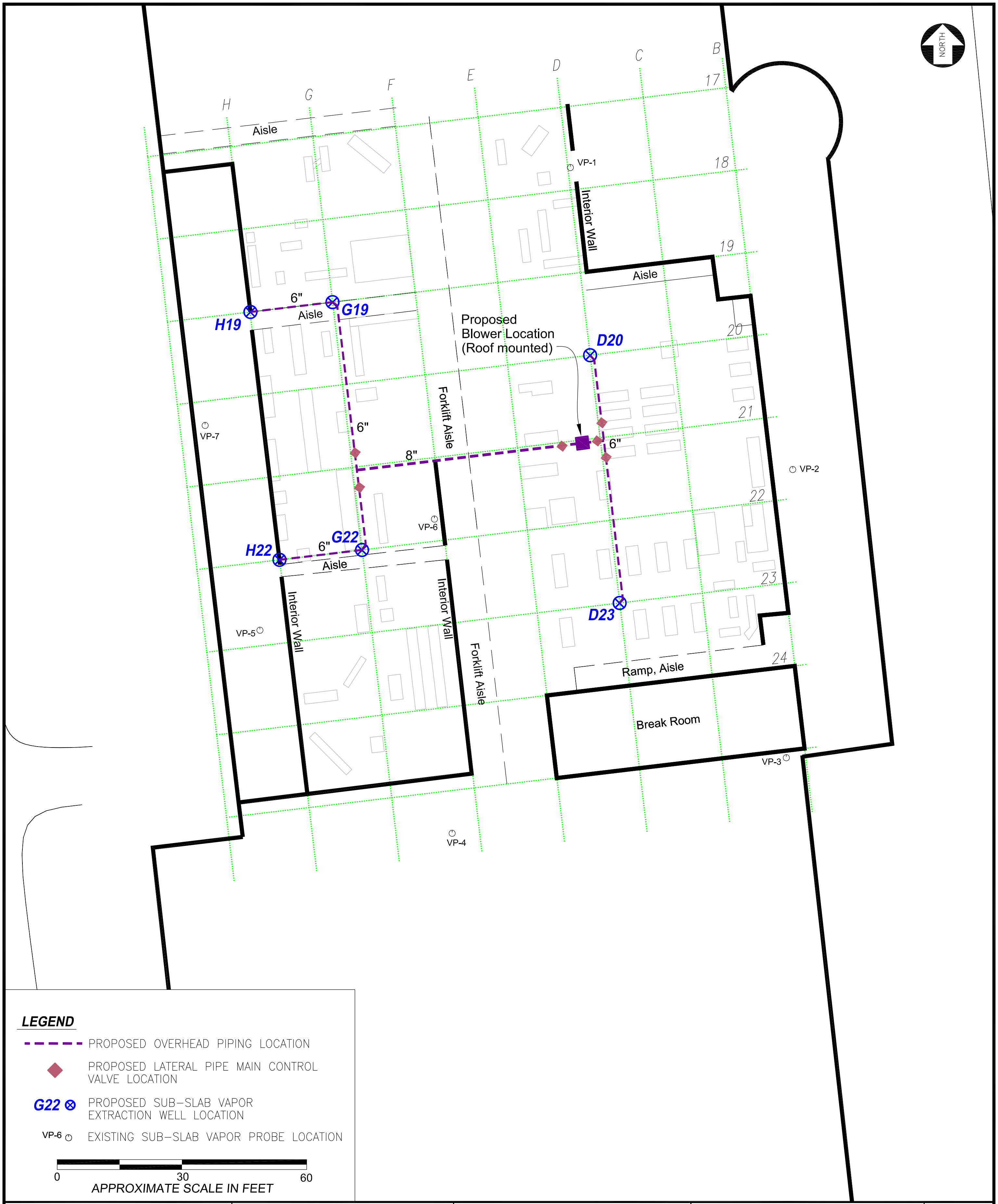
PROPOSED SUB-SLAB DEPRESSURIZATION EXTRACTION WELL LOCATIONS

FIGURE
9-1

SHEET 1 of 1



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APPROVED BY PJS	DATE June 2014
SOURCE Wells surveyed by Territorial Engineering; Fulton County, IN GIS, 2005; historical maps from Textron	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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ROCHESTER, INDIANA

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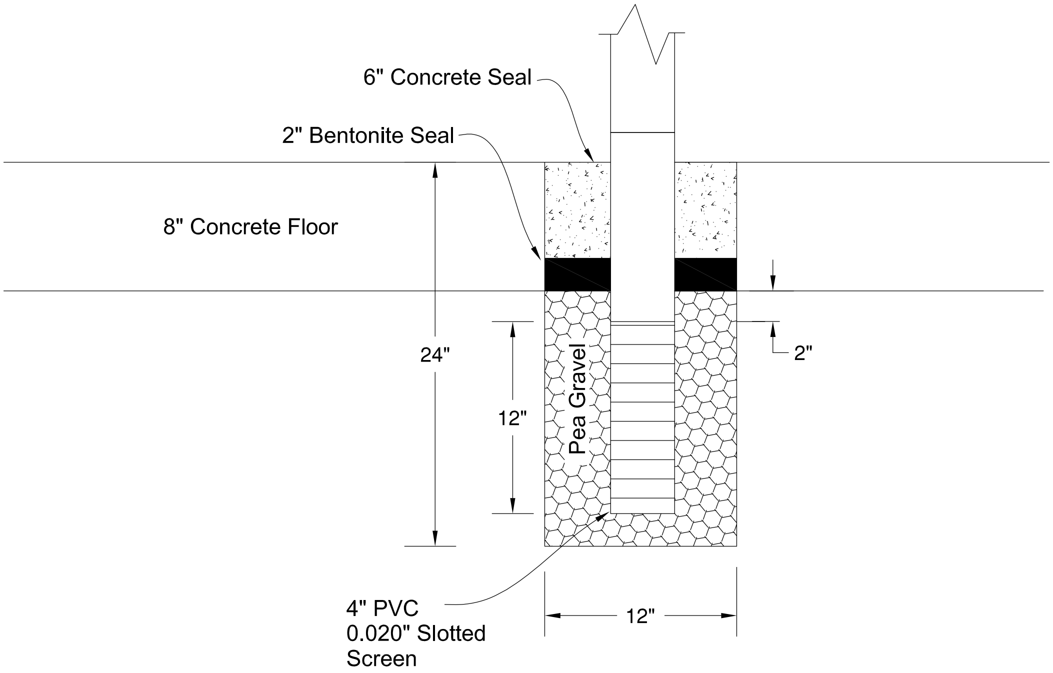
PROPOSED SUB-SLAB DEPRESSURIZATION SYSTEM ANCILLARY PIPING

FIGURE
9-2

SHEET 1 of 1



NOT TO SCALE

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APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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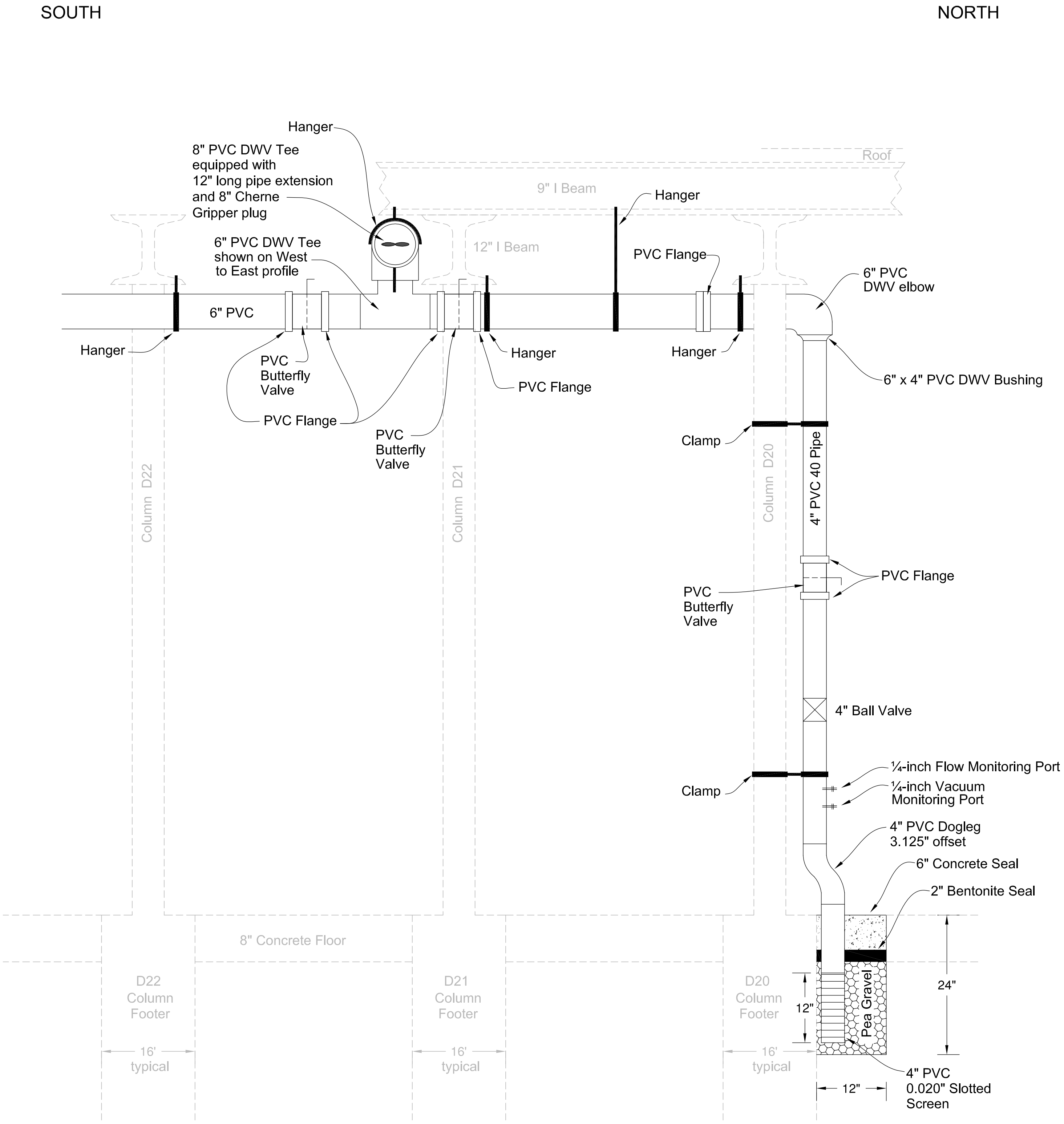
SSD SYSTEM
EXTRACTION WELL
CONSTRUCTION DETAIL

FIGURE
9-3

SHEET 1 of 1



NOTES:

1. Pipe hanger required for every 8 feet of horizontal piping.
2. Additional pipe hangers required where shown.
3. Existing features are dashed.

NOT TO SCALE

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APPROVED BY PJS	DATE June 2014
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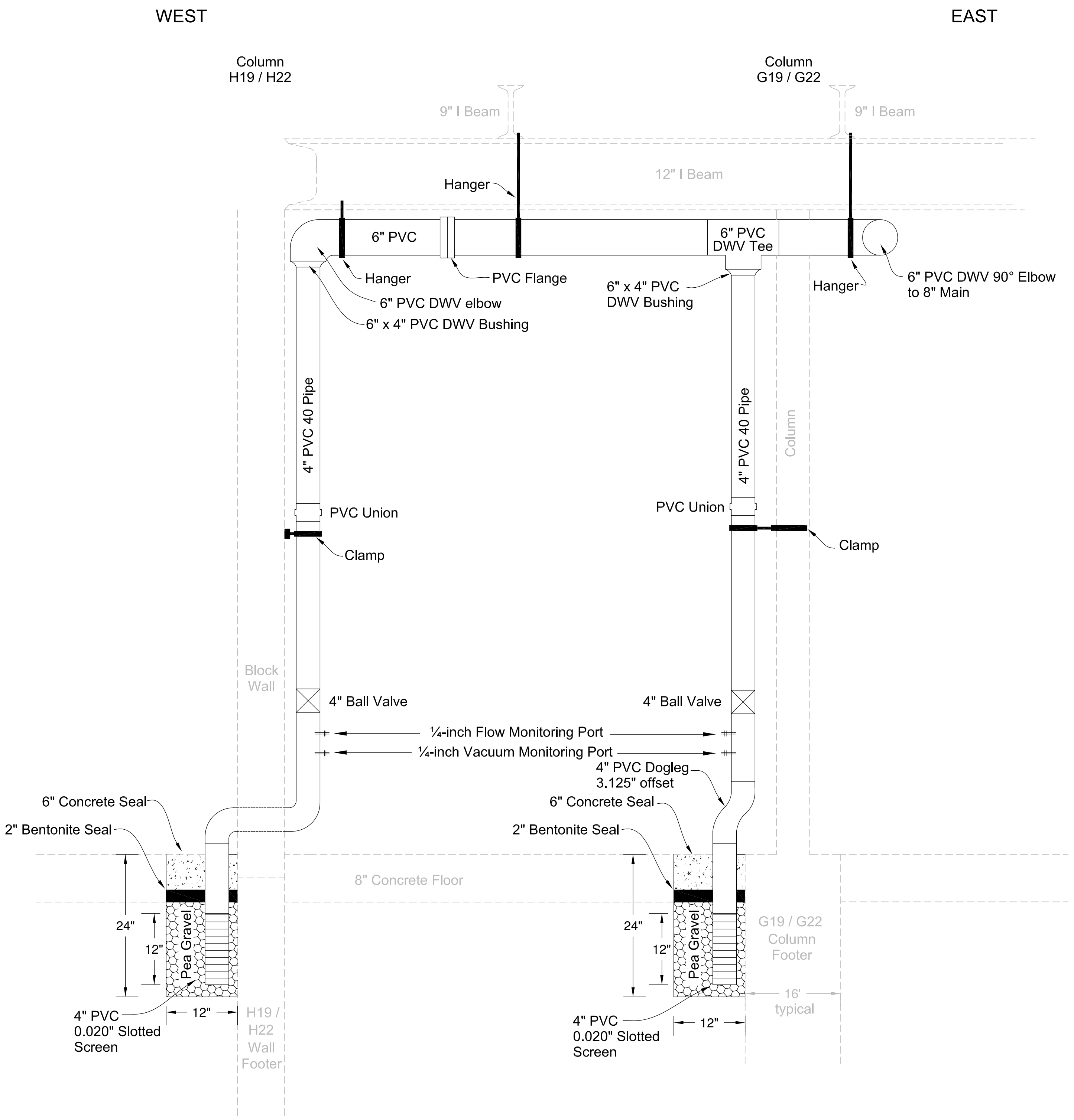
CROSS SECTION OF SSD SYSTEM ANCILLARY PIPING SOUTH TO NORTH

FIGURE
9-4

SHEET 1 of 1



NOTES:

1. Pipe hanger required for every 8 feet of horizontal piping.
2. Additional pipe hangers required where shown.
3. Section represents line form H19 to G19 and also along line H22 to G22.
4. Existing features are dashed.

NOT TO SCALE

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SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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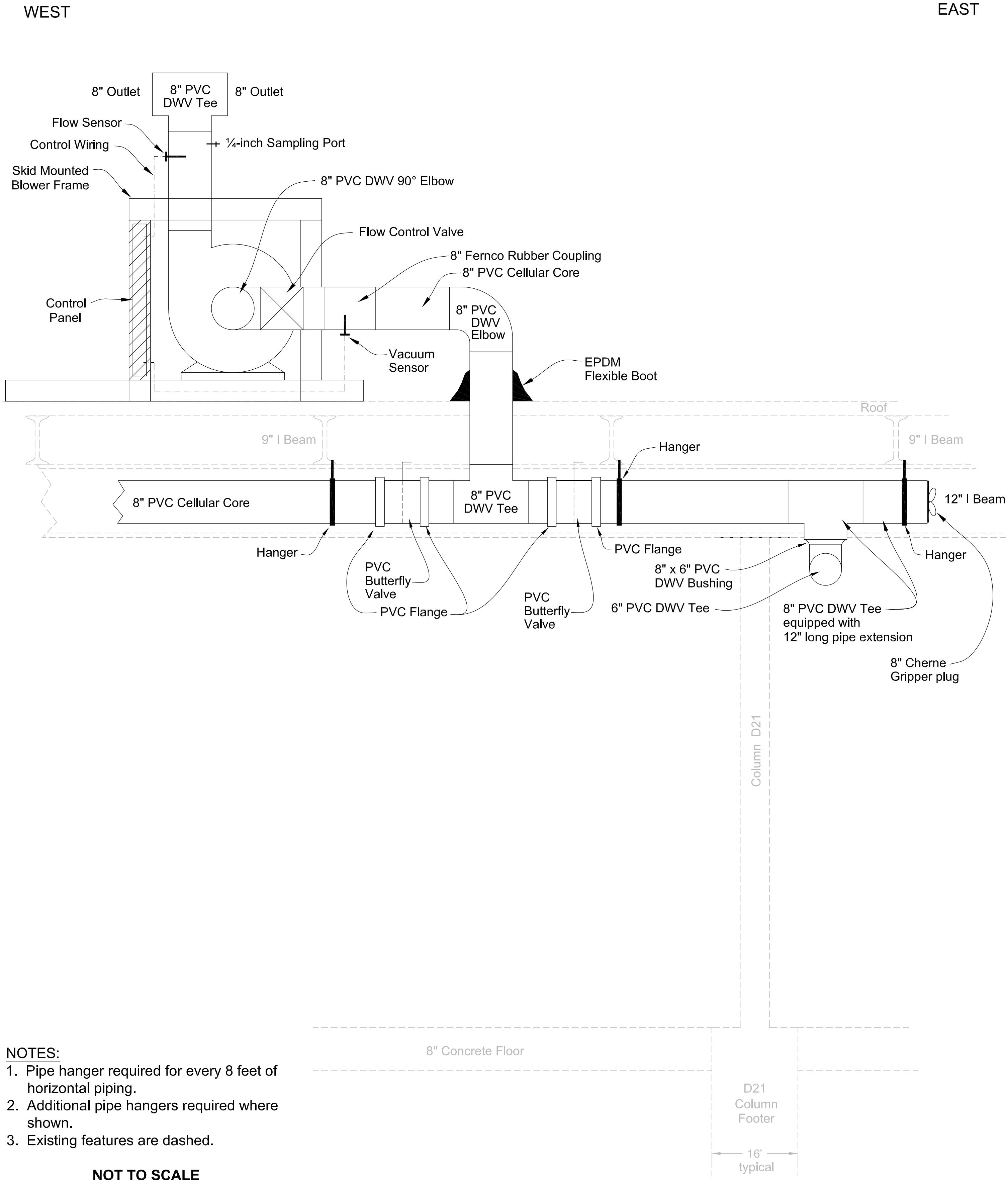
CROSS SECTION OF
SSD SYSTEM
6" LATERAL PIPING
WEST TO EAST

FIGURE
9-5

SHEET 1 of 1



NOTES:

1. Pipe hanger required for every 8 feet of horizontal piping.
2. Additional pipe hangers required where shown.
3. Existing features are dashed.

NOT TO SCALE

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RLB
FILE NO.
P:\Textron\TFS\Drawings\TFS Core Sections.dwg
APPROVED BY
PJS
DATE
June 2014
SOURCE
Survey provided by Territorial Engineering, LLC
PROJECT NO.
3359 12 2618
SCALE
SEE ABOVE

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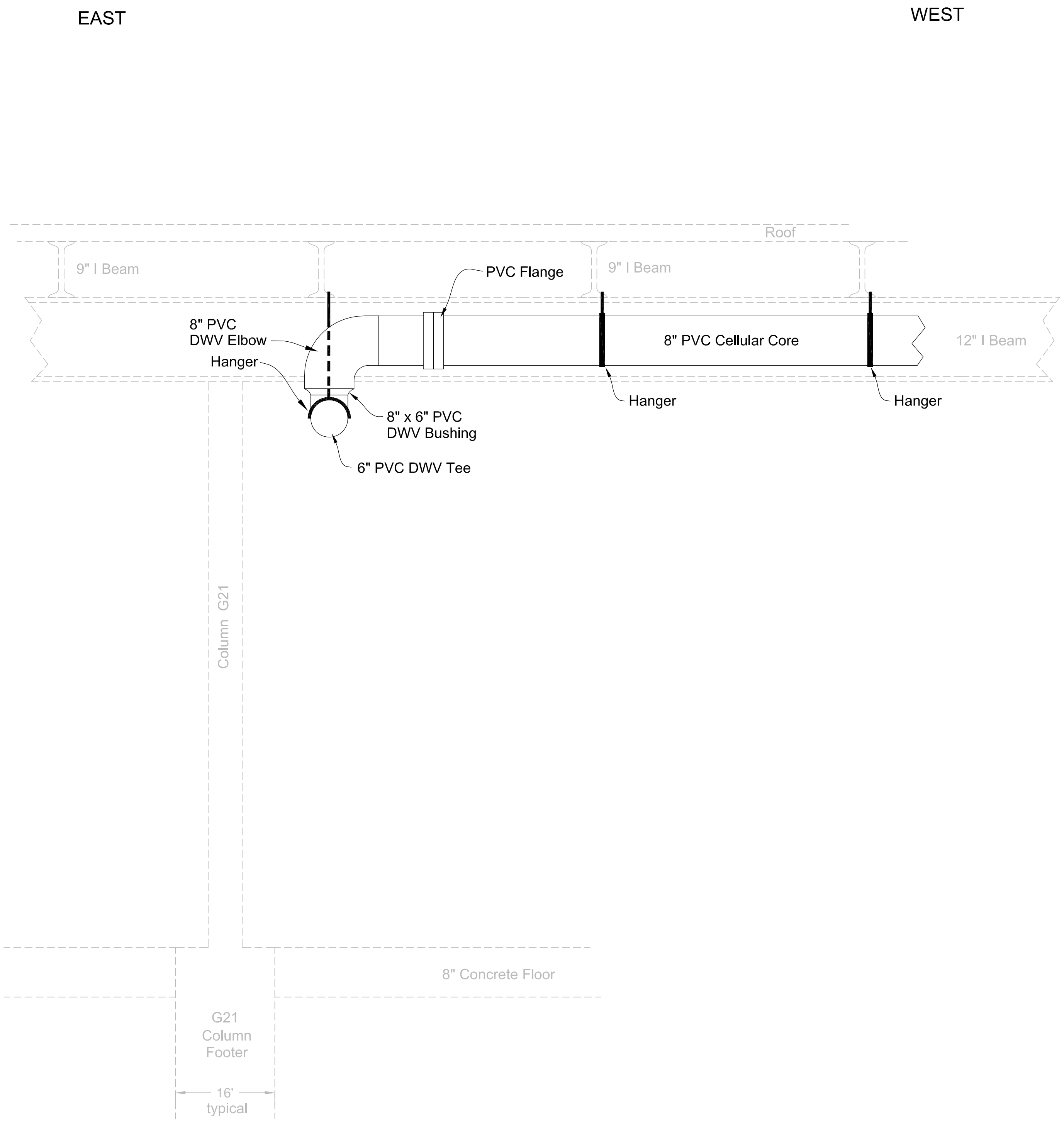
CROSS SECTION OF SSD SYSTEM BLOWER AND ANCILLARY PIPING WEST TO EAST

FIGURE
9-6

SHEET 1 of 1



NOTES:

1. Pipe hanger required for every 8 feet of horizontal piping.
2. Additional pipe hangers required where shown.
3. Existing features are dashed.

NOT TO SCALE

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APPROVED BY PJS	DATE June 2014
SOURCE Survey provided by Territorial Engineering, LLC	
PROJECT NO. 3359 12 2618	SCALE SEE ABOVE

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ROCHESTER, INDIANA

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CROSS SECTION OF SSD SYSTEM BLOWER 8" LATERAL PIPING EAST TO WEST

FIGURE
9-7

SHEET 1 of 1

APPENDIX B

TABLES

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-1	MTR-MW1-G051209	05/12/09	20 U	**1.3**	2.5 U	**3.3**	**3.4**	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW1-G082609	08/26/09	20 U	**1.4**	2.5 U	**3.1**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW1-G120209	12/02/09	20 U	**1.3**	2.5 U	**3.9**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW1-G040710	04/07/10	20 U	**1.7**	2.5 U	**6.0**	1 U	1 U	**0.78 J**	1 U	**0.42 J**	1 U	2 U	1 U	1 U	**0.36 J**	**0.89 J**	2 U
	MTR-MW1-G080510	08/05/10	20 U	**1.2**	2.5 U	**5.2**	**1.0**	1 U	**0.68 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**0.41 J**	2 U
	MTR-MW1-G120810	12/08/10	20 U	**1.4**	2.5 U	**7.4**	**1.2**	1 U	**0.62 J**	1 U	**0.62 J**	1 U	2 U	1 U	1 U	1 U	**0.87 J**	2 U
	MTR-MW1-G032311	03/23/11	20 U	**1.3**	2.5 U	**5.0**	1 U	1 U	**0.73 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**1.2**	2 U
	MTR-MW1-G092211	09/22/11	20 UJ	**1.3**	2.5 U	**6.1**	**1.0**	1 U	**0.54 J**	1 U	**0.57 J**	**0.53 J**	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW1-G041112	04/11/12	20 U	1 U	2.5 U	**2.6**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW1-G043013	04/30/13	20 U	**1.1**	2.5 U	**2.1**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW1-G043013R	04/30/13	20 U	1 U	2.5 U	**1.7**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-2	MTR-MW2-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW2-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW2-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW2-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-3	MTR-MW3-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**16**	**0.28 J**	2 U	1 U	1 U	1 U	**49**	2 U
	MTR-MW3-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.54 J**	1 U	2 U	1 U	1 U	1 U	**480**	2 U
	MTR-MW3-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.1**	**440 J**	1 U	2 U	1 U	**8.7**	**1.6**	**420 J**	2 U
	MTR-MW3-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**270**	**0.41 J**	2 U	1 U	**1.4**	1 U	**400**	**0.64 J**
	MTR-MW3-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**260**	**0.27 J**	2 U	1 U	**1.2**	1 U	**73**	2 U
	MTR-MW3-G121010	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**67 J**	**0.36 J**	2 U	1 U	1 U	1 U	**44 J**	2 U
	MTR-MW3-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**8.5**	**0.41 J**	2 U	1 U	1 U	1 U	**4**	**0.4 J**
	MTR-MW3-G092611	09/26/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	1 U	**0.5 J**	2 U	1 U	1 U	1 U	**1 J**	2 U
	ATR-MW3-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW3-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-4	MTR-MW4-G050809	05/08/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW4-G082809(1)	08/28/09	**1.6 J**	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW4-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW4-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-5	MTR-MW5-G050809	05/08/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW5-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW5-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW5-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-6B	MTR-MW6B-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.73 J**	**67**	1 U	2 U	1 U	**5.5**	1 U	**17**	2 U
	MTR-MW6B-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.71 J**	**64**	1 U	2 U	1 U	**5.1**	1 U	**16**	2 U
	MTR-MW6B-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**19 J**	1 U	2 U	1 U	1 U	1 U	**4.2 J**	2 U
	MTR-MW6B-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**13**	1 U	2 U	1 U	1 U	1 U	**1.8**	2 U
	MTR-MW6B-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**12**	1 U	2 UJ	1 U	1 U	1 U	**1.9**	2 U
	ATR-MW6B-G050313	05/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**34**	1 U	2 U	1 U	**3.0**	1 U	**19**	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-6C	MTR-MW6C-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**11**	**12000**	1 U	**0.84 J**	1 U	**68**	**2.7**	**1300**	2 U
	MTR-MW6C-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**25 J**	**17000**	1 U	2 U	1 U	**92**	**12 J**	**3000**	2 U
	MTR-MW6C-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**12**	**9000**	1 U	**0.97 J**	1 UJ	**94**	**8.3**	**750**	2 U
	MTR-MW6C-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**11**	**7400**	1 U	**0.5 J**	1 U	**98**	**6.5**	**1000**	2 U
	MTR-MW6C-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**15**	**12000**	1 U	**1.0 J**	**0.22 J**	**150 J**	**14**	**3800**	2 U
	MTR-MW6C-G121610	12/16/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**7700**	10 U	20 U	10 U	**42**	**18**	**1000**	20 U
	MTR-MW6C-G033011	03/30/11	**30 J**	10 U	25 U	10 U	10 U	10 U	10 U	**10**	**6000**	10 U	20 U	10 U	**25**	10 U	**910**	20 U
	MTR-MW6C-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**13**	**5200**	1 U	**1.1 J**	1 U	**38**	**11**	**690**	2 U
	ATR-MW6C-G041612	04/16/12	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**23**	**16000**	10 U	20.0 U	10 U	**56**	10 U	**730**	20 U
	ATR-MW6C-G092612	09/26/12	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**3600**	10 U	20.0 U	10 U	10 U	10 U	**1200**	20 U
	ATR-MW6C-G030513	03/05/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**2400**	5 U	10.0 U	5 U	**13**	5 U	**740**	10 U
	ATR-MW6C-G050713	05/07/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1800**	5 U	10.0 U	5 U	**10**	5 U	**1200**	10 U
	ATR-MW6C-G050713R	05/07/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1800**	5 U	10.0 U	5 U	**12**	5 U	**1500**	10 U
MW-7	MTR-MW7-G051109	05/11/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW7-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW7-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW7-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-8	MTR-MW8-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.5**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW8-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.7**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW8-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.3**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW8-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.5**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-9A	MTR-MW9A-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9A-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9A-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9A-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-9B	MTR-MW9B-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B - G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW9B-G092611	09/26/11	20 U	1 U	**1.1 J**	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW9B-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW9B-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-9C	MTR-MW9C-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	**4.4**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**2.6**	1 U	2 U
	MTR-MW9C-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	**4.2 J**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**2.1 J**	1 U	2 U
	MTR-MW9C-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	**4.7**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.7**	1 U	2 U
	MTR-MW9C-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	**2.3**	1 U	1 U	1 U	1 U	**0.43 J**	1 U	1 U	**2.1**	1 U	2 U
	MTR-MW9C - G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	**4.3**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.3**	1 U	2 U
	MTR-MW9C-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	**5.8**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.5**	1 U	2 U
	MTR-MW9C-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	**1.7**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.7**	1 U	2 U
	MTR-MW9C-G092611	09/26/11	20 U	1 U	2.5 U	1 U	1 U	1.5 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	**1.1**	1 U	2 U
	ATR-MW9C-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	**1.5**	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW9C-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-10A	MTR-MW10A-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10A-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10A-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10A-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
MW-10B	MTR-MW10B-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10B-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10B-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10B-G040810	04/08/10	20 UJ	1 UJ	2.5 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ
MW-10C	MTR-MW10C-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10C-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10C-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW10C-G040810	04/08/10	20 UJ	1 UJ	2.5 UJ	1 UJ	1 UJ	1 UJ	**0.26 J**	1 UJ	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ
MW-11	MTR-MW11-G051309	05/13/09	20 U	**0.23 J**	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.6**	**0.2 J**	2 U	**0.68 J**	1 U	**2.0**	1 U	2 U
	MTR-MW11-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.5**	1 U	2 U	1 U	1 U	**2.9**	1 U	2 U
	MTR-MW11-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.7**	**0.18 J**	2 U	1 U	1 U	**2.6**	1 U	**0.75 J**
	MTR-MW11-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.9**	1 U	2 UJ	1 U	1 U	**2.4**	**3.2**	2 U
	MTR-MW11-G081210	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	2 U	1 U	1 U	**3.4**	1 U	2 U
	MTR-MW11-G121310	12/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.5**	1 U	2 U	1 U	1 U	**2.8**	**7.8**	2 U
	MTR-MW11-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.2**	1 U	2 U	1 U	1 U	**3.2**	**1.1**	2 U
	MTR-MW11-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.4**	1 U	2 U	1 U	1 U	**3.3**	**4.3**	2 U
	ATR-MW11-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.8**	1 U	2 U	1 U	1 U	**2**	**1.7**	2 U
	ATR-MW11-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.5**	1 U	2 U	1 U	1 U	**3.8**	**95**	2 U
	ATR-MW11-G050613	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	1 U	**3.6**	**95**	2 U
MW-12	MTR-MW12-G051309	05/13/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.2**	**2500**	1 U	2 U	**0.34 J**	**27**	1 U	**1300**	2 U
	MTR-MW12-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.5**	**4100**	1 U	2 U	1 U	**43**	1 U	**1400**	2 U
	MTR-MW12-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.4**	**4900**	**0.19 J**	2 U	**0.61 J**	**40**	**0.71 J**	**1200**	2 U
	MTR-MW12-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.6**	**3100**	1 U	2 UJ	1 U	**16**	**1.4**	**1400**	2 U
	MTR-MW12-G081210	08/12/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**8.3 J**	**9300**	10 UJ	20 U	10 U	**30**	10 U	**2300**	20 U
	MTR-MW12-G121310	12/13/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**6900**	10 U	20 U	10 U	**29**	10 U	**1300**	20 U
	MTR-MW12-G032911	03/29/11	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	50 U	**25000**	50 U	100 U	50 U	**100**	50 U	**1600**	100 U
	MTR-MW12-G092811	09/28/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**12**	**3600**	5 U	10 U	5 U	**28**	5 U	**1700**	10 U
	ATR-MW12-G041712	04/17/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**3900**	5 U	10 U	5 U	**12**	5 U	**2000**	10 U
	ATR-MW12-G050613	05/06/13	500 U	25 U	62 U	25 U	25 U	25 U	25 U	25 U	**11000**	25 U	50 U	25 U	25 U	25 U	**700**	50 U

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(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-13	MTR-MW13-G051309	05/13/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.6**	**1700**	1 U	**1.1 J**	1 U	**15**	**14**	**580**	2 U
	MTR-MW13-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.4**	**2300**	1 U	**1.1 J**	1 U	**14**	**14**	**830**	2 U
	MTR-MW13-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**37 J**	1 U	2 U	1 U	**2.3**	1 U	**12 J**	2 U
	MTR-MW13-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.4**	**4300**	1 U	**1.6 J**	1 U	**34**	**16**	**490**	2 U
	MTR-MW13-G081210	08/12/10	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**4500**	5 UJ	10 U	5 U	**18**	**15**	**760**	10 U
	MTR-MW13-G121410	12/14/10	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**5700**	5 U	10 U	5 U	**28**	**15**	**940**	10 U
	MTR-MW13-G033011	03/30/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**4600**	5 U	10 U	5 U	**21**	**8.2**	**1000**	10 U
	MTR-MW13-G092811	09/28/11	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**12**	**6600**	10 U	20 U	10 U	**38**	**13**	**1900**	20 U
	ATR-MW13-G041712	04/17/12	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**14**	**10000**	10 U	20 U	10 U	**43**	**20**	**830**	20 U
	ATR-MW13-G092712	09/27/12	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**4900**	10 U	20 U	10 U	**31**	10 U	**440**	20 U
	ATR-MW13-G050613	05/06/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**3000**	10 U	20 U	10 U	10 U	10 U	**1600**	20 U
MW-14	MTR-MW14-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4**	**210**	1 U	2 U	1 U	**6.2**	**640**	**18**	2 U
	MTR-MW14-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.7**	**170**	1 U	2 U	1 U	**4.8**	**680**	**23**	2 U
	MTR-MW14-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**140**	1 U	2 U	1 U	**3.6**	**610**	**8.2**	2 U
	MTR-MW14-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.9**	**130**	1 U	r	1 U	**4.0**	**620**	**6.3**	2 U
	MTR-MW14-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.9**	**140**	1 U	2 U	1 U	**5.2**	**560**	**17**	2 U
	MTR-MW14-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3 J**	**100**	1 U	2 U	1 U	**3.4**	**510**	**5.9**	2 U
	MTR-MW14-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.8**	**88**	1 U	2 U	1 U	**3.1**	**530**	**4.4**	2 U
	MTR-MW14-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.8**	**88**	1 U	2 U	1 U	**3.2**	**420**	**7.6 J**	2 U
	ATR-MW14-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**110**	1 U	2 U	1 U	**3.7**	**560**	**59**	2 U
	ATR-MW14-G092712	09/27/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**53**	1 U	2 U	1 U	**2.3**	**390**	**30**	2 U
	ATR-MW14-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.2**	**60**	1 U	2 U	1 U	**2.7**	**380**	**6.1**	2 U
	ATR-MW14-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**55**	1 U	2 U	1 U	**2.3**	**320**	**4.2**	2 U
MW-15	MTR-MW15-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**7.5**	**1300**	1 U	2 U	1 U	**29**	**25**	**510**	2 U
	MTR-MW15-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**7.6**	**1400**	1 U	2 U	1 U	**42**	**29**	**440**	2 U
	MTR-MW15-G090309R	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**8.0**	**1600**	1 U	2 U	1 U	**45**	**29**	**520**	2 U
	MTR-MW15-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.9**	**1300**	1 U	2 U	1 U	**39**	**28**	**350**	2 U
	MTR-MW15-G121009R	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.0**	**5000**	1 U	**1.2 J**	1 UJ	**29**	**15**	**1300**	2 U
	MTR-MW15-G042010	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**9.2**	**1900**	1 U	2 UJ	1 U	**47**	**29**	**390**	2 U
	MTR-MW15-G042010R	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**9.1**	**1900**	1 U	2 UJ	1 U	**44**	**29**	**350**	2 U
	MTR-MW15-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**8.8**	**1800 J**	1 U	2 U	1 U	**50**	**29**	**380**	2 U
	MTR-MW15-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**8.8**	**1800 J**	1 U	2 U	1 U	**50**	**29**	**380**	2 U
	MTR-MW15-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**15**	**3000**	1 U	2 U	1 U	**64**	**37**	**560**	2 U
	MTR-MW15-G032911	03/29/11	8.8 J	5 U	12 U	5 U	5 U	5 U	5 U	**19**	**3900**	5 U	10 U	5 U	**68**	**68**	**640**	10 U
	MTR-MW15-G032911R	03/29/11	14 J	5 U	12 U	5 U	5 U	5 U	5 U	**19**	**3900**	5 U	10 U	5 U	**67**	**69**	**650**	10 U
	MTR-MW15-G092711	09/27/11	100 U	5 U	12 U	5 U	5 U	5 U	5 UJ	**7.2**	**1900**	5 U	10 U	5 U	**48**	**33**	**370**	10 U
	MTR-MW15-G092711R	09/27/11	100 U	5 U	12 U	5 U	5 U	5 U	5 UJ	**7**	**1800**	5 U	10 U	5 U	**45**	**30**	**350**	10 U
	ATR-MW15-G041312	04/13/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1800**	5 U	10 U	5 U	**57**	**28**	**350**	10 U
	ATR-MW15-G041312R	04/13/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1300**	5 U	10 U	5 U	**40**	**27**	**220**	10 U
	ATR-MW15-G030613	03/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**15**	**2800**	5 U	10 U	5 U	**71**	**200**	**380**	10 U
	ATR-MW15-G050213	05/02/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**2900**	10 U	20 U	10 U	**62**	**240**	**300**	20 U
	ATR-MW15-G050213R	05/02/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**14**	**2800**	5 U	10 U	5 U	**67**	**220**	**300**	10 U
	ATR-MW15-6082213	07/22/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**11**	**2100**	5 U	10 U	5 U	**58**	**160**	**190**	10 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-16	MTR-MW16-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.9**	**300**	1 U	2 U	1 U	**9.8**	**49**	**210**	2 U
	MTR-MW16-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.1**	**190**	1 U	2 U	1 U	**6.8**	**45**	**160**	2 U
	MTR-MW16-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.71 J**	**220**	1 U	2 U	1 U	**6.9**	**42**	**98**	2 U
	MTR-MW16-G042010	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.1**	**210**	1 U	2 U	1 U	**7.0**	**40**	**94**	2 U
	MTR-MW16-G081101	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**250**	1 U	2 U	1 U	**7.6**	**43**	**130**	2 U
	MTR-MW16-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**270**	1 U	2 U	1 U	**8.4**	**45**	**100**	2 U
	MTR-MW16-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**290**	1 U	2 U	1 U	**8.8**	**53**	**260**	2 U
	MTR-MW16-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	**0.51 J**	**330**	1 U	2 U	1 U	**8.3**	**36**	**220**	2 U
	ATR-MW16-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**420**	1 U	2 U	1 U	**10**	**45**	**220**	2 U
	ATR-MW16-G092612	09/26/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**360**	1 U	2 U	1 U	**11**	**42**	**130**	2 U
	ATR-MW16-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**370**	1 U	2 U	1 U	**12**	**27**	**260**	2 U
	ATR-MW16-G030613R	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**340**	1 U	2 U	1 U	**12**	**27**	**210**	2 U
	ATR-MW16-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**390**	1 U	2 U	1 U	**12**	**18**	**290**	2 U
	ATR-MW16-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**410**	1 U	2 U	1 U	**13**	**19**	**200**	2 U
MW-17	MTR-MW17-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	2.4	**160**	1 U	2 U	1 U	**5.2**	**300**	**2.8**	2 U
	MTR-MW17-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.1**	**140**	1 U	2 U	1 U	**4.7**	**330**	**1.6**	2 U
	MTR-MW17-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.4**	**92**	1 U	2 U	1 U	**3.4**	**270**	**1.6**	2 U
	MTR-MW17-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7 J**	**110 J**	1 U	2 UJ	1 U	**3.6** J	**360 J**	**1.5** J	2 U
	MTR-MW17-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.6**	**110**	1 U	2 U	1 U	**3.8**	**290**	**1.4**	2 U
	MTR-MW17-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**96**	1 U	2 U	1 U	**3.3**	**300**	1 U	2 U
	MTR-MW17-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1.3	**99**	1 U	2 U	1 U	**3.0**	**340**	1 U	2 U
	MTR-MW17-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1.3	**97**	1 U	2 U	1 U	**3.3**	**260**	1 U	2 U
	ATR-MW17-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**89**	1 U	2 U	1 U	**2.7**	**270**	1 U	2 U
	ATR-MW17-G092612	09/26/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**67**	1 U	2 U	1 U	**2.4**	**270**	1 U	2 U
	ATR-MW17-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**56**	1 U	2 U	1 U	**1.9**	**200**	1 U	2 U
	ATR-MW17-G030613R	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**58**	1 U	2 U	1 U	**1.9**	**220**	**1.7**	2 U
	ATR-MW17-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**46**	1 U	2 U	1 U	**1.5**	**210**	1 U	2 U
	ATR-MW17-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**51**	1 U	2 U	1 U	**1.8**	**190**	1 U	2 U
MW-18(38.6)	MTR-MW18(38.6)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(38.6)-G082709	08/27/09	20 U	1 U	2.5 U	**0.87** J	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(38.6)-G120209	12/02/09	20 U	1 U	2.5 U	**2.8**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(38.6)-G040810	04/08/10	20 U	1 U	2.5 U	**1.1**	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-18(63)	MTR-MW18(63)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	**1.2**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(63)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	**1.2**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(63)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	**1.2**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(63)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	**1.3 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-18(164)	MTR-MW18(164)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(164)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(164)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW18(164)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-19(33)	MTR-MW19(33)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(33)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(33)-G090109R	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(33)-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(33)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-19(53)	MTR-MW19(53)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**11**	1 U	2 U	1 U	1 U	1 U	**14**	2 U
	MTR-MW19(53)-G050509R	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**11**	1 U	2 U	1 U	1 U	1 U	**15**	2 U
	MTR-MW19(53)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**19**	1 U	2 U	1 U	1 U	1 U	**21**	2 U
	MTR-MW19(53)-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**12 J**	1 U	2 U	1 U	1 U	1 U	**6.1 J**	2 U
	MTR-MW19(53)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.49 J**	**25**	1 U	2 U	1 U	1 U	1 U	**16**	2 U
	MTR-MW19(53)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**20**	1 U	2 U	1 U	1 U	1 U	**20**	2 U
	MTR-MW19(53)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**21**	1 U	2 U	1 U	1 U	1 U	**10**	2 U
	MTR-MW19(53)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**24**	1 U	2 U	1 U	1 U	1 U	**15**	2 U
	MTR-MW19(53)-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**19 J**	1 U	2 U	1 U	1 U	1 U	**17**	2 U
	ATR-MW19(53)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**18**	1 U	2 U	1 U	1 U	1 U	**22**	2 U
	ATR-MW19(53)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**15**	1 U	2 U	1 U	1 U	1 U	**23**	2 U
MW-19(118)	MTR-MW19(118)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(118)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(118)-G120709	12/07/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW19(118)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-20(35)	MTR-MW20(35)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	**4.2**	1 U	1 U	**2.5**	**2200**	1 U	2 U	1 U	**29**	**14**	**1500**	2 U
	MTR-MW20(35)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**5.4**	**3500**	1 U	**1.4 J**	**0.19 J**	**24**	**13**	**2100**	2 U
	MTR-MW20(35)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.5**	**1900**	1 U	**1 J**	1 U	**20**	**7.1**	**490**	2 U
	MTR-MW20(35)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.4**	**2600**	1 U	**0.87 J**	1 U	**13**	**10**	**1100**	2 U
	MTR-MW20(35)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.9**	**2500**	1 U	**1.4 J**	**0.14 J**	**12**	**6.4**	**1000**	2 U
	MTR-MW20(35)-G121610	12/16/10	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**2200**	5 U	10 U	5 U	**10**	**10**	**1300**	10 U
	MTR-MW20(35)-G033011	03/30/11	8.4 J	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1400**	5 U	10 U	5 U	**4.7** J	**4.4 J**	**380**	10 U
	MTR-MW20(35)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.8**	**750**	1 U	**1.5 J**	1 U	**5.2**	**5.1**	**400**	2 U
	ATR-MW20(35)-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.7**	**3000**	1 U	**2.1**	1 U	**15**	**13**	**900**	2 U
	ATR-MW20(35)-G050713	05/07/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**360**	5 U	10 U	5 U	5 U	5 U	**510**	10 U

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TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-20(51)	MTR-MW20(51)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**72**	1 U	2 U	1 U	**0.40 J**	**0.76 J**	**220**	2 U
	MTR-MW20(51)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**88**	1 U	2 U	1 U	**0.69 J**	1 U	**80**	2 U
	MTR-MW20(51)-G090309R	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**91**	1 U	2 U	1 U	1 U	1 U	**71**	2 U
	MTR-MW20(51)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**62**	1 U	2 U	1 U	**0.42 J**	1 U	**110**	2 U
	MTR-MW20(51)-G121009R	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**59**	1 U	2 U	1 U	**0.40 J**	1 U	**100**	2 U
	MTR-MW20(51)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**40**	1 U	2 UJ	1 U	1 U	1 U	**81**	2 U
	MTR-MW20(51)-G041910R	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**42**	1 U	2 UJ	1 U	1 U	1 U	**81**	2 U
	MTR-MW20(51)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**34**	1 U	2 U	1 U	1 U	1 U	**45**	2 U
	MTR-MW20(51)-G081110R	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**35**	1 U	2 U	1 U	1 U	1 U	**47**	2 U
	MTR-MW20(51)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**59**	1 U	2 U	1 U	1 U	1 U	**680**	2 U
	MTR-MW20(51)-G121610R	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**56**	1 U	2 U	1 U	1 U	1 U	**670**	2 U
	MTR-MW20(51)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.8**	**1700**	1 U	2 U	1 U	**9.3 J**	1 U	**1100**	2 U
	MTR-MW20(51)-G033011R	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.4**	**1800**	1 U	2 U	1 U	**8.7 J**	1 U	**1200**	2 U
	MTR-MW20(51)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**140**	1 U	2 U	1 U	**0.70 J**	1 U	**120**	2 U
	MTR-MW20(51)-G092711R	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**120**	1 U	2 U	1 U	**0.72 J**	1 U	**130**	2 U
	ATR-MW20(51)-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**70**	1 U	2 U	1 U	**1.00 U**	1 U	**77**	2 U
	ATR-MW20(51)-G041712R	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**69**	1 U	2 U	1 U	**1.00 U**	1 U	**74**	2 U
	ATR-MW20(51)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.4**	**670**	1 U	2 U	1 U	**3.3**	1 U	**270**	2 U
	ATR-MW20(51)-G050713R	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.2**	**570**	1 U	2 U	1 U	**3.4**	1 U	**230**	2 U
MW-20(124)	MTR-MW20(124)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(124)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.0**	2 U
	MTR-MW20(124)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20 (124)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW20(124)-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW20(124)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-20(155)	MTR-MW20(155)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.4 J**	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW20(155)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW20(155)-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW20(155)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-21(40.2)	MTR-MW21(40.2)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.5**	1 U	2 U
	MTR-MW21(40.2)-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.5**	1 U	2 U
	MTR-MW21(40.2)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.4**	1 U	2 U
	MTR-MW21(40.2)-G083109R	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.4**	1 U	2 U
	MTR-MW21(40.2)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.5**	1 U	2 U
	MTR-MW21(40.2)-G120409R	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.5**	1 U	2 U
	MTR-MW21(40.2)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.6**	1 U	2 U
	MTR-MW21(40.2)-G041310R	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**1.6**	1 U	2 U
MW-21(128)	MTR-MW21(128)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(128)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(128)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(128)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-21(155.3)	MTR-MW21(155.3)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(155.3)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(155.3)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW21(155.3)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-22(37)	MTR-MW22(37)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(37)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(37)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(37)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-22(67.7)	MTR-MW22(67.7)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(67.7)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(67.7)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(67.7)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-22(130.7)	MTR-MW22(130.7)-G050709(2)	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(130.7)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(130.7)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW22(130.7)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 U	2 U	1 U	1 UJ	1 UJ	1 U	2 U
MW-23(39.9)	MTR-MW23(39.9)-G051109	05/11/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(39.9)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(39.9)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	**2.2**	1 U	**0.37 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(39.9)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	**0.73 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-23(105.6)	MTR-MW23(105.6)-G051109	05/11/09	20 U	1 U	2.5 U	1 U	**8.0**	1 U	**1.4**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	**10**	1 U	**1.2**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G082809R	08/28/09	20 U	1 U	2.5 U	1 U	**9.1**	1 U	**1.2**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G120309	12/03/09	20 U	1 U	2.5 UJ	1 U	**8.3**	1 U	**1.4**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G120309R	12/03/09	20 U	1 U	**2.7 J**	1 U	**9.1**	1 U	**1.0**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	**1.5 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(105.6)-G040810R	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	**1.4 J**	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date^1	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-23(122.7)	MTR-MW23(122.7)-G051109	05/11/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(122.7)-G082809	08/28/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(122.7)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW23(122.7)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-24(24.9)	MTR-MW24(24.9)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(24.9)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(24.9)-G120809	12/08/09	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(24.9)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**0.38 J**	1 U	2 U
	MTR-MW24(24.9)-6082213	07/22/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-24(55.4)	MTR-MW24(55.4)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.78 J**	**56**	1 U	2 U	1 U	**7.1**	**150**	**1.5**	2 U
	MTR-MW24(55.4)-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.75 J**	**55**	1 U	2 U	1 U	**7.0**	**150**	**1.5**	2 U
	MTR-MW24(55.4)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.71 J**	**68**	1 U	2 U	1 U	**6.2**	**150**	1 U	2 U
	MTR-MW24(55.4)-G090209R	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.75 J**	**69**	1 U	2 U	1 U	**6.4**	**150**	1 U	2 U
	MTR-MW24(55.4)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.52 J**	**59**	1 U	2 U	1 U	**5.0**	**130**	**0.77 J**	2 U
	MTR-MW24(55.4)-G120809R	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.50 J**	**53**	1 U	2 U	1 U	**4.4**	**130**	1 U	2 U
	MTR-MW24(55.4)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.76 J**	**98**	1 U	r	1 U	**7.9**	**170**	**0.75 J**	2 U
	MTR-MW24(55.4)-G041410R	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.85 J**	**100**	1 U	r	1 U	**9.1**	**180**	**0.85 J**	2 U
	MTR-MW24(55.4)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**92**	1 U	2 U	1 U	**5.3**	**110**	1 U	2 U
	MTR-MW24(55.4)-G080910R	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**83**	1 U	2 U	1 U	**5.2**	**110**	1 U	2 U
	MTR-MW24(55.4)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**130**	1 U	2 U	1 U	**9.3**	**140**	1 UJ	2 U
	MTR-MW24(55.4)-G121410R	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.75 J**	**110**	1 U	2 U	1 U	**8.3**	**130**	**1.2 J**	2 U
	MTR-MW24(55.4)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**120**	1 U	2 U	1 U	**8.3**	**160**	1 U	2 U
	MTR-MW24(55.4)-G032811R	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**120**	1 U	2 U	1 U	**9.4**	**170**	1 U	2 U
	MTR-MW24(55.4)-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**83**	1 U	2 U	1 U	**7.1**	**110**	1.7 U	2 U
	MTR-MW24(55.4)-G092811R	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**80**	1 U	2 U	1 U	**6.7**	**130**	1.6 U	2 U
	ATR-MW24(55.4)-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**67**	1 U	2 U	1 U	**5.8**	**140**	1 U	2 U
	ATR-MW24(55.4)-G041312R	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**65**	1 U	2 U	1 U	**5.5**	**110**	1 U	2 U
	ATR-MW24(55.4)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**61**	1 U	2 U	1 U	**5.9**	**130**	**1.6**	2 U
	ATR-MW24(55.4)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**57**	1 U	2 U	1 U	**4.5**	**110**	1 U	2 U
	ATR-MW24(55.4)-G050213R	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**64**	1 U	2 U	1 U	**5.5**	**110**	1 U	2 U
MW-24(122.6)	MTR-MW24(122.6)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(122.6)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(122.6)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(122.6)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-24(159.4)	MTR-MW24(159.4)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(159.4)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(159.4)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW24(159.4)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-25(16.4)	MTR-MW25(16.4)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.9**	**1500**	1 U	2 U	1 U	**9.9**	**7.8**	**980**	2 U
	MTR-MW25(16.4)-G051409R	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.8**	**1400**	1 U	2 U	1 U	**9.6**	**6.4**	**980**	2 U
	MTR-MW25(16.4)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.1**	**1500**	1 U	2 U	1 U	**9.9**	1 U	**1200**	2 U
	MTR-MW25(16.4)-G090209R	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.3**	**1500**	1 U	2 U	1 U	**9.0**	1 U	**1300**	2 U
	MTR-MW25(16.4)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.45 J**	**1300 J**	1 U	2 U	1 U	**1.2 J**	**26 J**	**960 J**	2 U
	MTR-MW25(16.4)-G121009R	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.2 J**	**1400**	1 U	2 U	1 U	**8.0 J**	**1.5 J**	**980**	2 U
	MTR-MW25(16.4)-G042010	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.0**	**1200**	1 U	2 UJ	1 U	**9.1**	**1.1**	**610**	2 U
	MTR-MW25(16.4)-G042010R	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.1**	**1300**	1 U	2 UJ	1 U	**9.6**	**1.1**	**680**	2 U
	MTR-MW25(16.4)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.6 J**	**1400 J**	1 U	2 U	1 U	**8.4 J**	1 U	**780**	2 U
	MTR-MW25(16.4)-G081110R	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.6**	**1500**	1 U	2 U	1 U	**7.2**	**0.52 J**	**880**	2 U
	MTR-MW25(16.4)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.5 J**	**1800**	1 U	2 U	1 U	**9.8**	1 U	**960**	2 U
	MTR-MW25(16.4)-G032911	03/29/11	13 J	5 U	12 U	5 U	5 U	5 U	5 U	**5.2**	**2000**	5 U	10 U	5 U	**9.4**	5 U	**960**	10 U
	MTR-MW25(16.4)-G092711	09/27/11	100 U	5 U	12 U	5 U	5 U	5 U	5 UJ	**2.9 J**	**2500**	5 U	10 U	5 U	**11**	**1.1 J**	**860**	10 U
	ATR-MW25(16.4)-G041612	04/16/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1700**	5 U	10 U	5 U	**6.8**	5 U	**660**	10 U
	ATR-MW25(16.4)-G092712	09/27/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1800**	5 U	10 U	5 U	5 U	5 U	**630**	10 U
	ATR-MW25(16.4)-G030613	03/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**2600**	5 U	10 U	5 U	**15**	5 U	**560**	10 U
	ATR-MW25(16.4)-G050213	05/02/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**2500**	10 U	20 U	10 U	10 U	10 U	**520**	20 U
MW-25(32.6)	MTR-MW25(32.6)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.8**	**440**	1 U	2 U	1 U	**3.4**	**150**	**400**	2 U
	MTR-MW25(32.6)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**280**	1 U	2 U	1 U	**1.5**	**81**	**290**	2 U
	MTR-MW25(32.6)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.6**	**220 J**	1 U	2 U	1 U	**36**	**27**	**310**	2 U
	MTR-MW25(32.6)-G042010	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**280**	1 U	2 UJ	1 U	**1.3**	**4.9**	**370**	2 U
	MTR-MW25(32.6)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**210 J**	1 U	2 U	1 U	**1.1**	1 U	**140**	2 U
	MTR-MW25(32.6)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**110**	1 U	2 U	1 U	1 U	1 U	**110**	2 U
	MTR-MW25(32.6)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**420**	1 U	2 U	1 U	**2.0**	1 U	**570**	2 U
	MTR-MW25(32.6)-G092711	09/27/11	20 U	1 U	1.1 J	1 U	1 U	1 U	1 UJ	**4.2**	**1200**	1 U	2 U	1 U	**5.9**	**0.3 J**	**290**	2 U
	ATR-MW25(32.6)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.8**	**590**	1 U	2 U	1 U	**2.0**	1 U	**270**	2 U
	ATR-MW25(32.6)-G030613	03/06/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**1300**	10 U	20 U	10 U	10.0 U	10 U	**440**	20 U
	ATR-MW25(32.6)-G050213	05/02/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1500**	5 U	10 U	5 U	5.0 U	5 U	**360**	10 U
MW-25(45.2)	MTR-MW25(45.2)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.5**	**410**	1 U	2 U	1 U	**33**	**11**	**170**	2 U
	MTR-MW25(45.2)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.5**	**430**	1 U	2 U	1 U	**29**	**9.2**	**300**	2 U
	MTR-MW25(45.2)-G121009	12/10/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.2**	**350**	1 UJ	2 UJ	1 UJ	**26**	**6.7**	**80 J**	2 U
	MTR-MW25(45.2)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7**	**390**	1 U	2 UJ	1 U	**28**	**6.3**	**100**	2 U
	MTR-MW25(45.2)-6082213	07/22/13	40 U	2 U	5 U	2 U	2 U	2 U	2 U	**3.1**	**750**	2 U	4 UJ	2 U	**71**	**7.1**	**92**	4 U
MW-25(82)	MTR-MW25(82)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.47 J**	1 U	2 U	1 U	1 U	1 U	**4.8**	2 U
	MTR-MW25(82)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**3.2**	2 U
	MTR-MW25(82)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.47 J**	1 U	2 U	1 U	1 U	1 U	**2.4**	2 U
	MTR-MW25(82)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.40 J**	1 U	2 UJ	1 U	1 U	1 U	**2.2**	2 U
	MTR-MW25(82)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.61 J**	1 U	2 U	1 U	1 U	1 U	**2.2**	2 U
	MTR-MW25(82)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.8**	2 U
	MTR-MW25(82)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.70 J**	1 U	2 U	1 U	1 U	1 U	**2.6**	2 U
	MTR-MW25(82)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	**0.63 J**	1 U	2 U	1 U	1 U	1 U	**3.0**	2 U
	ATR-MW25(82)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**1.9**	2 U
	ATR-MW25(82)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.4**	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-25(145)	MTR-MW25(145)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW25(145)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW25(145)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW25(145)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.4**	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
MW-26(17.5)	MTR-MW26(17.5)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7**	**1000**	1 U	2 U	1 U	**15**	**12**	**250**	2 U
	MTR-MW26(17.5)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.6**	**960**	1 U	2 U	1 U	**15**	**13**	**270**	2 U
	MTR-MW26(17.5)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.9**	**1400**	1 U	2 U	1 U	**15**	**8.4**	**290**	2 U
	MTR-MW26(17.5)-G041910	04/19/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.7**	**1000**	1 U	2 UJ	1 U	**16**	**5.7**	**250**	2 U
	MTR-MW26(17.5)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.7**	**1200 J**	1 U	2 U	1 U	**14**	**6.1**	**250 J**	2 U
	MTR-MW26(17.5)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.0 J**	**1900**	1 U	2 U	1 U	**16**	**5.9**	**440**	2 U
	MTR-MW26(17.5)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.4**	**1500**	1 U	2 U	1 U	**15**	**6.4**	**560**	2 U
	MTR-MW26(17.5)-G092711	09/27/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**2.5**	**1300**	5 U	10 U	5 U	**12**	**4.2 J**	**390**	10 U
	ATR-MW26(17.5)-G041612	04/16/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**950**	5 U	10 U	5 U	**9**	5 U	**270**	10 U
	ATR-MW26(17.5)-G092712	09/27/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.8**	**770**	1 U	2 U	1 U	**12**	**4.1**	**380**	2 U
	ATR-MW26(17.5)-G010813	01/08/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1200**	5 U	10 U	5 U	**15**	5 U	**500**	10 U
	ATR-MW26(17.5)-G030613	03/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1200**	5 U	10 U	5 U	**14**	5 U	**430**	10 U
	ATR-MW26(17.5)-G040313	04/03/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1200**	5 U	10 U	5 U	**12**	5 U	**650**	10 U
	ATR-MW26(17.5)-G050213	05/03/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**880**	5 U	10 U	5 U	**11**	5 U	**530**	10 U
MW-26(28.8)	MTR-MW26(28.8)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**84**	1 U	2 U	1 U	**3.6**	**26**	**19**	2 U
	MTR-MW26(28.8)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**36**	1 U	2 U	1 U	**1.6**	**25**	**23**	2 U
	MTR-MW26(28.8)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**28**	1 U	2 U	1 U	**1.5**	**20**	**14**	2 U
	MTR-MW26(28.8)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.25 J**	**36**	1 U	2 U	1 U	**1.8**	**24**	**15**	2 U
	ATR-MW26(28.8)-G092712	09/27/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1 U**	**45**	1 U	2 U	1 U	**2.2**	**22**	**13**	2 U
	ATR-MW26(28.8)-G092712R	09/27/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1 U**	**47**	1 U	2 U	1 U	**2.3**	**24**	**14**	2 U
	ATR-MW26(28.8)-G010813	01/08/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.4**	**480**	1 U	2 U	1 U	**9.9**	**1 U**	**130**	2 U
	ATR-MW26(28.8)-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.2**	**330**	1 U	2 U	1 U	**10**	**1 U**	**150**	2 U
	ATR-MW26(28.8)-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.5**	**460**	1 U	2 U	1 U	**11**	**1.4**	**240**	2 U
	ATR-MW26(28.8)-G050213	05/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**490**	1 U	2 U	1 U	**14**	**1.9**	**200**	2 U
MW-26(58.2)	MTR-MW26(58.2)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.6 J**	1 U	2 U	1 U	1 U	**1.5**	**0.7 J**	2 U
	MTR-MW26(58.2)-G051209R	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.0 J**	1 U	2 U	1 U	1 U	**1.6**	**0.8 J**	2 U
	MTR-MW26(58.2)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.0**	1 U	2 U	1 U	1 U	**2.1**	1 U	2 U
	MTR-MW26(58.2)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.5**	1 U	2 U	1 U	1 U	**2.0**	**0.69 J**	2 U
	MTR-MW26(58.2)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.2**	1 U	2 U	1 U	1 U	**2.0**	1 U	2 U
	MTR-MW26(58.2)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	1 U	**1.9**	**0.66 J**	2 U
	MTR-MW26(58.2)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**3.1**	1 U	2 U	1 U	1 U	**1.9**	1 U	2 U
	MTR-MW26(58.2)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.0**	1 U	2 U	1 U	1 U	**2.2**	1 U	2 U
	MTR-MW26(58.2)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	**5.7**	1 U	2 U	1 U	1 U	**1.8**	1 U	2 U
	ATR-MW26(58.2)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.2**	1 U	2 U	1 U	1 U	**1.8**	1 U	2 U
	ATR-MW26(58.2)-G060413	06/04/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.4**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-26(114.8)	MTR-MW26(114.8)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(114.8)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(114.8)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(114.8)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-26(143.6)	MTR-MW26(143.6)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(143.6)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(143.6)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW26(143.6)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-27(18)	MTR-MW27(18)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.2**	**840**	1 U	2 U	1 U	**6.6**	**13**	**360**	2 U
	MTR-MW27(18)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.7**	**1100**	1 U	2 U	1 U	**7.9**	**19**	**510**	2 U
	MTR-MW27(18)-G090209R	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.6**	**1200**	1 U	2 U	1 U	**7.6**	**20**	**610**	2 U
	MTR-MW27(18)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.9**	**1100 J**	1 U	2 U	1 U	**6.4**	**16 J**	**400**	2 U
	MTR-MW27(18)-G120909R	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.5**	**1400 J**	1 U	2 U	1 U	**6.6**	**13 J**	**400**	2 U
	MTR-MW27(18)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.2**	**610**	1 U	2 U	1 U	**4.4**	**5.3**	**170**	2 U
	MTR-MW27(18)-G041410R	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**650**	1 U	2 U	1 U	**4.7**	**6.1**	**170**	2 U
	MTR-MW27(18)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.0**	**1100**	1 U	2 U	1 U	**7.1**	**11**	**270**	2 U
	MTR-MW27(18)-G081010R	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.3 J**	**1000**	1 U	2 U	1 U	**7.9 J**	**11 J**	**210**	2 U
	MTR-MW27(18)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.2 J**	**790**	1 U	2 U	1 U	**5.7**	**20**	**160**	2 U
	MTR-MW27(18)-G121510R	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.1 J**	**780**	1 U	2 U	1 U	**5.5**	**19**	**150**	2 U
	MTR-MW27(18)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7**	**560**	1 U	2 U	1 U	**4.3**	**26**	**110**	2 U
	MTR-MW27(18)-G032811R	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7**	**580**	1 U	2 U	1 U	**4.4**	**28**	**130**	2 U
	MTR-MW27(18)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	**1.8**	**1000**	1 U	2 U	1 U	**6.3**	**43**	**190**	2 U
	MTR-MW27(18)-G092711R	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	**1.7**	**970**	1 U	2 U	1 U	**6.0**	**41**	**160**	2 U
	ATR-MW27(18)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2**	**950**	1 U	2 U	1 U	**5.2**	**35**	**190**	2 U
	ATR-MW27(18)-G041612R	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.1**	**940**	1 U	2 U	1 U	**5.4**	**39**	**180**	2 U
	ATR-MW27(18)-G030613	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.6**	**510**	1 U	2 U	1 U	**3.9**	**25**	**110**	2 U
	ATR-MW27(18)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.7**	**600**	1 U	2 U	1 U	**4.1**	**30**	**120**	2 U
	ATR-MW27(18)-G050213R	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**550**	1 U	2 U	1 U	**4.2**	**28**	**110**	2 U
MW-27(53.05)	MTR-MW27(53.05)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.64 J**	1 U	2 U	1 U	1 U	**52**	1 U	2 U
	MTR-MW27(53.05)-G051209R	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.59 J**	1 U	2 U	1 U	1 U	**49**	1 U	2 U
	MTR-MW27(53.05)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**55**	1 U	2 U
	MTR-MW27(53.05)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.56 J**	1 U	2 U	1 U	1 U	**40**	1 U	2 U
	MTR-MW27(53.05)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.62 J**	1 U	2 U	1 U	1 U	**36**	1 U	2 U
	MTR-MW27(53.05)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**31 J**	1 U	2 U
	MTR-MW27(53.05)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**12**	1 U	2 U
	MTR-MW27(53.05)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**28**	1 U	2 U
	MTR-MW27(53.05)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	**0.87 J**	1 U	2 U	1 U	1 U	**18**	1 U	2 U
	ATR-MW27(53.05)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**15**	1 U	2 U
	ATR-MW27(53.05)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.0**	1 U	2 U	1 U	1 U	**14**	1 U	2 U
	ATR-MW27(53.05)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.6**	2 U

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Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-27(75.4)	MTR-MW27(75.4)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**30**	1 U	2 U	1 U	**1.2**	**37**	**1.6**	2 U
	MTR-MW27(75.4)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**33**	1 U	2 U	1 U	**1.5**	**37**	**1.1**	2 U
	MTR-MW27(75.4)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**24**	1 U	2 U	1 U	**1.1**	**31**	**1.1**	2 U
	MTR-MW27(75.4)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**34**	1 U	2 U	1 U	**1.4**	**31**	**1.2**	2 U
	MTR-MW27(75.4)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**36**	1 U	2 U	1 U	**1.2**	**32**	**1.5**	2 U
	MTR-MW27(75.4)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**30**	1 U	2 U	1 U	1 U	**29**	1 U	2 U
	MTR-MW27(75.4)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**30**	1 U	2 U	1 U	1 U	**29**	1 U	2 U
	MTR-MW27(75.4)-G092711	09/27/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	**0.3 J**	**29**	1 U	2 U	1 U	**1.2**	**20**	**1.3**	2 U
	MTR-MW27(75.4)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**27**	1 U	2 U	1 U	**1.3**	**21**	1 U	2 U
	ATR-MW27(75.4)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**20**	1 U	2 U	1 U	1 U	**14**	1 U	2 U
MW-27(104.2)	MTR-MW27(104.2)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.4**	2 U
	MTR-MW27(104.2)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**8.6**	2 U
	MTR-MW27(104.2)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**5.7**	2 U
	MTR-MW27(104.2)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.3**	2 U
	MTR-MW27(104.2)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**5.2 J**	2 U
	MTR-MW27(104.2)-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.4**	2 U
	MTR-MW27(104.2)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.2**	2 U
	MTR-MW27(104.2)-G092711	09/27/11	20 U	1 U	**1.1 J**	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.2**	2 U
	ATR-MW27(104.2)-G041612	04/16/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.7**	2 U
	ATR-MW27(104.2)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.7**	2 U
MW-27(135)	MTR-MW27(135)-G051209	05/12/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW27(135)-G090209	09/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW27(135)-G120909	12/09/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW27(135)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-28(24.3)	MTR-MW28(24.3)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(24.3)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(24.3)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(24.3)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW28(24.3)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-28(53.2)	MTR-MW28(53.2)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(53.2)-G050509R	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(53.2)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(53.2)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(53.2)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW28(53.2)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-28(117.7)	MTR-MW28(117.7)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(117.7)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(117.7)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(117.7)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW28(117.7)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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MW-28(138.1)	MTR-MW28(138.1)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(138.1)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(138.1)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW28(138.1)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW28(138.1)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-29(82.5)	MTR-MW29(82.5)-G050609	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(82.5)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(82.5)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(82.5)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-29(103.3)	MTR-MW29(103.3)-G050609	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(103.3)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(103.3)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(103.3)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-29(132.8)	MTR-MW29(132.8)-G050609	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G082709	08/27/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW29(132.8)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(132.8)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW29(132.8)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-30(41.1)	MTR-MW30(41.1)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	**1.0**	**130**	1 U	2 U	1 U	**2.7**	**77**	**2.2**	2 U
	MTR-MW30(41.1)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.2**	**150**	1 U	2 U	1 U	**3.2**	**82**	**3.5**	2 U
	MTR-MW30(41.1)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.62 J**	**95**	1 U	2 U	1 U	**2.1**	**65**	**2.8**	2 U
	MTR-MW30(41.1)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.70 J**	**82**	1 U	2 U	1 U	**1.8**	**72**	**1.8**	2 U
	MTR-MW30(41.1)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**73**	1 U	2 U	1 U	**1.3**	**59**	**1.6**	2 U
	MTR-MW30(41.1)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**59**	1 U	2 U	1 U	1 U	**58**	1 U	2 U
	MTR-MW30(41.1)-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**76**	1 U	2 U	1 U	**1.6**	**60**	**2.1**	2 U
	MTR-MW30(41.1)-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**75**	1 U	2 U	1 U	**1.8**	**57**	2.2 U	2 U
	ATR-MW30(41.1)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**120**	1 U	2 U	1 U	**2.7**	**58**	1 U	2 U
	ATR-MW30(41.1)-G041312	04/13/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**110**	1 U	2 U	1 U	**2.2**	**56**	1 U	2 U
	ATR-MW30(41.1)-G060413	06/04/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**110**	1 U	2 U	1 U	**2.2**	**61**	1 U	2 U
MW-30(120.2)	MTR-MW30(120.2)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(120.2)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(120.2)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(120.2)-G041410	04/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-30(148)	MTR-MW30(148)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(148)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(148)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW30(148)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-31(30.9)	MTR-MW31(30.9)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.89 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G090109R	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.87 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.81 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G120309R	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.79 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G040910R	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.68 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.54 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(30.9)-G092611	09/26/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	**1.2**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(30.9)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(30.9)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-31(55.5)	MTR-MW31(55.5)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(55.5)-G092611	09/26/11	20 U	1 U	**1.1 J**	1 U	1 U	1 U	1 UJ	1 U	**0.39 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(55.5)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(55.5)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-31(98.5)	MTR-MW31(98.5)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(98.5)-G092611	09/26/11	20 U	1 U	**1.1 J**	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**1.4**	2 U
	ATR-MW31(98.5)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(98.5)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.0**	2 U
MW-31(139.2)	MTR-MW31(139.2)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G050509R	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G090109	09/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW31(139.2)-G092611	09/26/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(139.2)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW31(139.2)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-32(24.1)	MTR-MW32(24.1)-G050609	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.8**	1 U	2 U	1 U	**0.43 J**	1 U	1 U	2 U
	MTR-MW32(24.1)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.4**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(24.1)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.2**	1 U	2 U	1 U	**0.45 J**	1 U	**2.2**	2 U
	MTR-MW32(24.1)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.2**	1 U	2 U	1 U	**0.47 J**	1 U	**5.2**	2 U
	MTR-MW32(24.1)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**6.9 J**	1 U	2 U	1 U	1 U	1 U	**3.6 J**	2 U
	MTR-MW32(24.1)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.6**	1 U	2 U	1 U	1 U	1 U	**2.4**	2 U
	MTR-MW32(24.1)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**5.1**	1 U	2 U	1 U	1 U	1 U	**5.7**	2 U
	MTR-MW32(24.1)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.5**	1 U	2 U	1 U	1 U	1 U	**1.6**	2 U
	ATR-MW32(24.1)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**6.8**	1 U	2 U	1 U	1 U	1 U	**4.4**	2 U
	ATR-MW32(24.1)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.6**	1 U	2 U	1 U	1 U	1 U	**3.8**	2 U
MW-32(89)	MTR-MW32(89)-G050609(3)	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**12**	2 U
	MTR-MW32(89)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**15**	2 U
	MTR-MW32(89)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**12**	2 U
	MTR-MW32(89)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**9.4**	2 U
	MTR-MW32(89)-G041510R	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**12**	2 U
	MTR-MW32(89)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**12 J**	2 U
	MTR-MW32(89)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**11**	2 U
	MTR-MW32(89)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**10**	2 U
	MTR-MW32(89)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**11**	2 U
	ATR-MW32(89)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**11**	2 U
	ATR-MW32(89)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**9.7**	2 U

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Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-32(110)	MTR-MW32(110)-G050609	05/06/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW32(110)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**0.42 J**	2 U
	ATR-MW32(110)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW32(110)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-33(23.1)	MTR-MW33(23.1)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(23.1)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(23.1)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(23.1)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-33(70.9)	MTR-MW33(70.9)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(70.9)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(70.9)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(70.9)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-33(129.1)	MTR-MW33(129.1)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(129.1)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(129.1)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(129.1)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-33(208.9)	MTR-MW33(208.9)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(208.9)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(208.9)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW33(208.9)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-34(37)	MTR-MW34(37)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 UJ	1 U	1 UJ	2 U	1 U	1 U	1 U	1 U	2 UJ
	MTR-MW34(37)-G121010	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G032511	03/25/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(37)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW34(37)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW34(37)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.4**	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-34(85)	MTR-MW34(85)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**12**	1 U	2 U
	MTR-MW34(85)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**14**	1 U	2 U
	MTR-MW34(85)-G090309R	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**14**	1 U	2 U
	MTR-MW34(85)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**13**	1 U	2 U
	MTR-MW34(85)-G120809R	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**14**	1 U	2 U
	MTR-MW34(85)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	**15**	1 U	2 U
	MTR-MW34(85)-G041510R	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**15**	1 U	2 U
	MTR-MW34(85)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**15**	1 U	2 U
	MTR-MW34(85)-G121010	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**16**	1 U	2 U
	MTR-MW34(85)-G032511	03/25/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**19**	1 U	2 U
	MTR-MW34(85)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**19**	1 U	2 U
	ATR-MW34(85)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**17**	1 U	2 U
	ATR-MW34(85)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**18**	1 U	2 U
MW-34(110)	MTR-MW34(110)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	**3.1**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.3**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	**0.29 J**	1 U	1 U	2 U
	MTR-MW34(110)-G080910	08/09/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**2.4**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G121010	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.7**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G032511	03/25/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.5**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(110)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW34(110)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.3**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW34(110)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.6**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-34(135)	MTR-MW34(135)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(135)-G090309	09/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(135)-G120809	12/08/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW34(135)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
MW-35(45)	MTR-MW35(45)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G120810	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(45)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(45)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(45)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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MW-35(90)	MTR-MW35(90)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(90)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(90)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(90)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-35(148)	MTR-MW35(148)-G050509	05/05/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW35(148)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(148)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW35(148)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-36(35.2)	MTR-MW36(35.2)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(35.2)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(35.2)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(35.2)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-36(92.4)	MTR-MW36(92.4)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**0.40 J**	2 U
	MTR-MW36(92.4)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(92.4)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(92.4)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(92.4)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-36(124.5)	MTR-MW36(124.5)-G050609	05/06/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**0.39 J**	2 U
	MTR-MW36(124.5)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW36(124.5)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(124.5)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW36(124.5)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-37(23.3)	MTR-MW37(23.3)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(23.3)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(23.3)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(23.3)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-37(70)	MTR-MW37(70)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(70)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(70)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(70)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-37(98)	MTR-MW37(98)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.25 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G080310R	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G120710R	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G032211R	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW37(98)-G092011R	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(98)-G0410121	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(98)-G041012R	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(98)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW37(98)-G050113R	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-38(20.8)	MTR-MW38(20.8)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(20.8)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(20.8)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(20.8)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-38(29.1)	MTR-MW38(29.1)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G082509R	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G120109R	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G040610R	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(29.1)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(29.1)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(29.1)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-38(69.9)	MTR-MW38(69.9)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**0.47 J**	2 U
	MTR-MW38(69.9)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G080310R	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G120710R	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G032211R	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(69.9)-G092011R	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(69.9)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(69.9)-G041012R	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(69.9)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(69.9)-G050213R	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-38(102.5)	MTR-MW38(102.5)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW38(102.5)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(102.5)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW38(102.5)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-39(13)	MTR-MW39(13)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(13)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(13)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(13)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-39(29.3)	MTR-MW39(29.3)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(29.3)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(29.3)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(29.3)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-39(76.8)	MTR-MW39(76.8)-G050409	05/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G082509	08/25/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G040610	04/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G080310	08/03/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G120710	12/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G032211	03/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW39(76.8)-G092011	09/20/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(76.8)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW39(76.8)-G050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-40(198.8)	MTR-MW40(198.8)-G051109	05/11/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
(Bedrock Well)	MTR-MW40(198.8)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW40(198.8)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW40(198.8)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-41(190)	MTR-MW41(190)-G051509	05/15/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
(Bedrock Well)	MTR-MW41(190)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW41(190)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW41(190)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-42(175.3)	MTR-MW42(175.3)-G050709	05/07/09	**49 J**	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
(Bedrock Well)	MTR-MW42(175.3)-G082709	08/27/09	20 U	1 U	**3.1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	**0.46 J**	1 U	1 U	1 U	2 U
	MTR-MW42(175.3)-G120209	12/02/09	20 U	1 U	**2.6**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW42(175.3)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
MW-43(190)	MTR-MW43(190)-G051509	05/15/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
(Bedrock Well)	MTR-MW43(190)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW43(190)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW43(190)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-44(185.9)	MTR-MW44(185.9)-G051109	05/11/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
(Bedrock Well)	MTR-MW44(185.9)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW44(185.9)-G120309	12/03/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW44(185.9)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-45(185) (Bedrock Well)	MTR-MW45(185)-G051409	05/14/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G083109	08/31/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G120409	12/04/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW45(185)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW45(185)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW45(185)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-46(95.5)	MTR-MW46(95.5)-G050709	05/07/09	20 U	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW46(95.5)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW46(95.5)-G120109	12/01/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW46(95.5)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-47(109.7)	MTR-MW47(109.7)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(109.7)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(109.7)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(109.7)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-47(137.8)	MTR-MW47(137.8)-G050709	05/07/09	20 UJ	1 U	2.5 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G082609	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G082609R	08/26/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G120209	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G120209R	12/02/09	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW47(137.8)-G040810R	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-48(56)	MTR-MW48(56)-G040810(4)	04/08/10	20 UJ	1 UJ	2.5 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ
	MTR-MW48(56)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(56)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(56)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(56)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW48(56)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-48(105)	MTR-MW48(105)-G040910(4)	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(105)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(105)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(105)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(105)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW48(105)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-48(129)	MTR-MW48(129)-G040910	04/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(129)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(129)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(129)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW48(129)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW48(129)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-48(159)	MTR-MW48(159)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	**2.6**	2 U
	MTR-MW48(159)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.1**	2 U
	MTR-MW48(159)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**3.8**	2 U
	MTR-MW48(159)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**3.5**	2 U
	MTR-MW48(159)-G092111	09/21/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.7**	2 U
	ATR-MW48(159)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.5**	2 U
	ATR-MW48(159)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.3**	2 U
	ATR-MW48(159)-G043013R	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**2.6**	2 U
MW-49(20)	MTR-MW49(20)-G040710(4)	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(20)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(20)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(20)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(20)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW49(20)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-49(45)	MTR-MW49(45)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(45)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(45)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(45)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(45)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW49(45)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-49(95)	MTR-MW49(95)-G040710(4)	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(95)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(95)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(95)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(95)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW49(95)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-49(200)	MTR-MW49(200)-G040710	04/07/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(200)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(200)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(200)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW49(200)-G092111	09/21/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW49(200)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-50(45)	MTR-MW50(45)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.7**	1 U	2 UJ	1 U	**0.54 J**	1 U	**0.53 J**	2 U
	MTR-MW50(45)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.1**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(45)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.1**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(45)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.2**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(45)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.7**	1 U	2 U	1 U	**0.45 J**	1 U	1 U	2 U
	ATR-MW50(45)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.4**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW50(45)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.8**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-50(80)	MTR-MW50(80)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(80)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(80)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(80)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(80)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW50(80)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW50(80)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-50(130)	MTR-MW50(130)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(130)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(130)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(130)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW50(130)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW50(130)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW50(130)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-51(25)	MTR-MW51(25)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.35 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(25)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(25)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(25)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(25)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(25)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(25)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-51(70)	MTR-MW51(70)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(70)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(70)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(70)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(70)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(70)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(70)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-51(117)	MTR-MW51(117)-G041510	04/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(117)-G081010	08/10/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(117)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(117)-G032911	03/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW51(117)-G092211	09/22/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(117)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW51(117)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-52(55)	MTR-MW52(55)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.86 J**	1 U	2 U	1 U	1 U	1 U	**0.79 J**	2 U
	MTR-MW52 (55)-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.45 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(55)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(55)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(55)-G092311	09/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.33 J**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW52(55)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW52(55)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-52(148)	MTR-MW52(148)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52 (148)-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(148)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(148)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW52(148)-G092311	09/23/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW52(148)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-53(41)	MTR-MW53(41)-G040810	04/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW53(41)-G080410	08/04/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW53(41)-G120810	12/08/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW53(41)-G032311	03/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW53(41)-G092211	09/22/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW53(41)-G041012	04/10/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW53(41)-G043013	04/30/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW-55(49)	MTR-MW55(49)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.6**	1 U	2 U	1 U	1 U	**4.2**	1 U	2 U
	MTR-MW55(49)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.0**	1 U	2 U	1 U	1 U	**3.3**	1 U	2 U
	MTR-MW55(49)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.7**	1 U	2 U	1 U	1 U	**3.1**	1 U	2 U
	MTR-MW55(49)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.2**	1 U	2 U	1 U	1 U	**3.7**	1 U	2 U
	MTR-MW55(49)-G092311	09/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.7**	1 U	2 U	1 U	1 U	**2.8**	1 U	2 U
	ATR-MW55(49)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.5**	1 U	2 U	1 U	1 U	**3.0**	1 U	2 U
	ATR-MW55(49)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.5**	1 U	2 U	1 U	1 U	**1.9**	1 U	2 U
MW-56(50)	MTR-MW56(50)-G042010	04/20/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**15**	1 U	2 UJ	1 U	1 U	1 U	**3.0**	2 U
	MTR-MW56 (50)-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**14**	1 U	2 U	1 U	1 U	1 U	**2.6**	2 U
	MTR-MW56(50)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**16**	1 U	2 U	1 U	1 U	1 U	**3.0**	2 U
	MTR-MW56(50)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**19**	1 U	2 U	1 U	1 U	1 U	**3.8**	2 U
	MTR-MW56(50)-G092311	09/23/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**16**	1 U	2 U	1 U	**0.41 J**	1 U	**3.2**	2 U
	ATR-MW56(50)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**16**	1 U	2 U	1 U	1 U	1 U	**3.8**	2 U
	ATR-MW56(50)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**12**	1 U	2 U	1 U	1 U	1 U	**2.6**	2 U
MW-57(38)	MTR-MW57(38)-G041210	04/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.9**	1 U	2 U	1 U	1 U	**2.2**	1 U	2 U
	MTR-MW57(38)-G080510	08/05/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.9**	1 U	2 U	1 U	1 U	**2.4**	1 U	2 U
	MTR-MW57(38)-G120910	12/09/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.5**	1 U	2 U	1 U	1 U	**1.6**	1 U	2 U
	MTR-MW57(38)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.6**	1 U	2 U	1 U	1 U	**2.3**	1 U	2 U
	MTR-MW57(38)-G092811	09/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1.9 U	1 U	2 U	1 U	1 U	**2.1**	1 U	2 U
	ATR-MW57(38)-G041112	04/11/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**4.4**	1 U	2 U	1 U	1 U	**3.8**	1 U	2 U
	ATR-MW57(38)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.2**	1 U	2 U	1 U	1 U	**3.5**	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-59(29)	MTR-MW59(29)-G042010	04/20/10	r	r	r	r	r	r	r	r	r	r	r	r	r	r	r	r
	MTR-MW59(29)-G042010R	04/20/10	r	r	r	r	r	r	r	r	r	r	r	r	r	r	r	r
	MTR-MW59(29)-G051110(6)	05/11/10	20 UJ	**0.58 J**	2.5 UJ	1 UJ	1 UJ	1 UJ	1 UJ	**130**	**40000**	**6.5 J**	2 UJ	**74 J**	**350**	**190**	**17000**	**19 J**
	MTR-MW59(29)-G081110	08/11/10	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**220**	**57000 J**	100 U	200 U	**84 J**	**290**	100 U	**9200**	200 U
	MTR-MW59(29)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**220**	**53000**	**9.2**	2 U	**110**	**310**	**520**	**12000**	**26**
	MTR-MW59(29)-G033011	03/30/11	**73 J**	20 U	50 U	20 U	20 U	20 U	20 U	**270**	**56000**	**9.0 J**	40 U	**100**	**340**	**390**	**17000**	**22 J**
	MTR-MW59(29)-G092811(4)	09/28/11	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**370**	**39000**	50 U	100 U	**96**	**340**	**84**	**13000**	**62**
	ATR-MW59(29)-G041712	04/17/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**230**	**55000**	50 U	100 U	**54**	**250**	50 U	**18000**	100 U
	ATR-MW59(29)-G092712	09/27/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**220**	**42000**	50 U	100 U	**64**	**290**	50 U	**10000**	100 U
	ATR-MW59(29)-G010713	01/07/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**150**	**31000**	50 U	100 U	**58**	**190**	50 U	**13000**	100 U
	ATR-MW59(29)-G020413	02/04/13	**10**	5 U	12 U	5 U	5 U	5 U	5 U	**160**	**29000**	6.8	10 U	**53**	**190**	5 U	**18000**	**18**
	ATR-MW59(29)-G030613	03/06/13	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**69**	**18000**	20 U	40 U	**48**	**140**	20 U	**23000**	40 U
	ATR-MW59(29)-G050213	05/02/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	100 U	**26000**	100 U	200 U	**54**	100 U	100 U	**21000**	200 U
MW-59(46)	MTR-MW59(46)-G042010	04/20/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**11**	**1900**	10 U	20 U	10 U	**5.9 J**	**9.6 J**	**190**	20 U
	MTR-MW59(46)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.1**	**360**	**2.5 J**	2 U	**0.89 J**	**3.2**	**2.3**	**100**	**3.5**
	MTR-MW59(46)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**12**	**1400**	**4.6**	2 U	**1.5**	**8.9**	**120**	**250**	**6.1**
	MTR-MW59(46)-G121610R	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	**11**	**1300**	**4.3**	2 U	**1.4**	**7.7**	**100**	**260**	**5.7**
	MTR-MW59(46)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**17**	**2800**	**5.7**	2 U	**1.6**	**14 J**	**140**	**280**	**7.1**
	MTR-MW59(46)-G033011R	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**18**	**2800**	**5.9**	2 U	**1.6**	**14 J**	**140**	**290**	**7.5**
	MTR-MW59(46)-G092811	09/28/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**19**	**2800**	**9.8**	10 U	**4.6**	**18**	**490**	**320**	**17**
	MTR-MW59(46)-G092811R	09/28/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**19**	**2800**	**10**	10 U	**4.9**	**15**	**500**	**350**	**17**
	ATR-MW59(46)-G041712	04/17/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**14**	**2700**	**7**	10 U	**2.3**	**11**	**810**	**86**	**9.8**
	ATR-MW59(46)-G041712R	04/17/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**17**	**3000**	**7.9**	10 U	**2.4**	**13**	**880**	**100**	**11**
	ATR-MW59(46)-G092612	09/26/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**33**	**4400**	**10**	10 U	5 U	**26**	**650**	**260**	**13**
	ATR-MW59(46)-G092612R	09/26/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**32**	**4000**	**11**	10 U	5 U	**25**	**570**	**260**	**14**
	ATR-MW59(46)-G030513	03/05/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**25**	**3400**	**8.6**	10 U	**3.2**	**21**	**790**	**200**	**11**
	ATR-MW59(46)-G050213	05/02/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**20**	**2900**	**8.8**	10 U	**3.4**	**18**	**700**	**140**	10 U
MW-60(38)	MTR-MW60(38)-G042910	04/29/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**94**	**0.34 J**	2 U	**0.18 J**	**0.44 J**	1 U	**170 J**	**0.71 J**
	MTR-MW60(38)-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**78**	**0.4 J**	2 U	1 U	1 U	1 U	**90**	**0.45 J**
	MTR-MW60(38)-G121410	12/14/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**24**	**0.44 J**	2 U	1 U	1 U	1 U	**100**	**0.48 J**
	MTR-MW60(38)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**45**	**0.47 J**	2 U	1 U	1 U	1 U	**260**	**1.3 J**
	MTR-MW60(38)-G092311	09/23/11	20 UJ	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**73**	**0.78 J**	2 U	1 U	**0.31 J**	1 U	**250**	**0.64 J**
	ATR-MW60(38)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**37**	1 U	2 U	1 U	1 U	1 U	**83**	2 U
	ATR-MW60(38)-G092612	09/26/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**31**	1 U	2 U	1 U	1 U	1 U	**250**	2 U
	ATR-MW60(38)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**33**	1 U	2 U	1 U	1 U	1 U	**140**	2 U
	ATR-MW60(38)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**62**	1 U	2 U	1 U	1 U	1 U	**210**	2 U
MW-61(26)	MTR-MW61(26)-G041310	04/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**96**	1 U	2 U	1 U	**0.46 J**	1 U	**140**	2 U
	MTR-MW61(26)-G080610	08/06/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**15**	1 U	2 U	1 U	1 U	1 U	**8.6**	2 U
	MTR-MW61(26)-G121010	12/10/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**64**	**0.39 J**	2 U	1 U	1 U	1 U	**42**	**0.37 J**
	MTR-MW61(26)-G032411	03/24/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-MW61(26)-G092611	09/26/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.9**	2 U
	ATR-MW61(26)-G041212	04/12/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	**4.5**	2 U
	ATR-MW61(26)-G050713	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW61(26)-G050713R	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

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Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-62(36)	MTR-MW62(36)-G041910	04/19/10	400 U	20 U	50 U	20 U	20 U	20 U	20 U	20 U	**1400**	20 U	40 UJ	20 U	20 U	20 U	**1100**	40 U
	MTR-MW62(36)-G081110	08/11/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**0.85 J**	**710**	1 UJ	**1.3 J**	1 U	**3.7**	**2.8**	**1000**	2 U
	MTR-MW62(36)-G121610	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**610**	1 U	2 U	1 U	**3.0**	**2.2**	**2600**	2 U
	MTR-MW62(36)-G121610R	12/16/10	20 U	1 U	2.5 U	1 U	1 UJ	1 U	1 U	1 U	**610**	1 U	2 U	1 U	**3.2**	**2.0**	**2400**	2 U
	MTR-MW62(36)-G033011	03/30/11	**16 J**	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1800**	5 U	10 U	5 U	**5.2 J**	5 U	**5300**	10 U
	MTR-MW62(36)-G092811	09/28/11	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**800**	10 U	20 U	10 U	**3.8 J**	10 U	**5500**	20 U
	ATR-MW62(36)-G041612	04/16/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1500**	5 U	10 U	5 U	5 U	5 U	**4500**	10 U
	ATR-MW62(36)-G050213	05/02/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**2400**	10 U	20 U	10 U	10 U	10 U	**2000**	20 U
MW-65(32)	MTR-MW65(32)-G041610	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**2.1**	1 U	2 UJ	1 U	1 U	1 U	**31**	2 U
	MTR-MW65(32)-G081210	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**53**	1 UJ	2 U	1 U	1 U	1 U	**100**	2 U
	MTR-MW65(32)-G081210R	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**52**	1 UJ	2 U	1 U	1 U	1 U	**120**	2 U
	MTR-MW65(32)-G121310	12/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.0**	1 U	2 U	1 U	1 U	1 U	**2700**	2 U
	MTR-MW65(32)-G121310R	12/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**3.1**	1 U	2 U	1 U	1 U	1 U	**2700**	2 U
	MTR-MW65(32)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**280**	1 U	2 U	0.27 J	1.3	1 U	**3100**	2 U
	MTR-MW65(32)-G033011R	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**300**	1 U	2 U	0.27 J	1.2	1 U	**3000**	2 U
	MTR-MW65(32)-G092911	09/29/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**5.6**	**2600**	5 U	10 U	5 U	**16 J**	5 U	**1500**	10 U
	MTR-MW65(32)-G092911R	09/29/11	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**4.9**	**2500**	5 U	10 U	5 U	**12 J**	5 U	**1400**	10 U
	ATR-MW65(32)-G041712	04/17/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1000**	5 U	10 U	5 U	5 U	5 U	**380**	10 U
	ATR-MW65(32)-G041712R	04/17/12	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1000**	5 U	10 U	5 U	5 U	5 U	**400**	10 U
	ATR-MW65(32)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**270**	1 U	2 U	1 U	**1.6**	1 U	**250**	2 U
	ATR-MW65(32)-G050613	05/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**300**	1 U	2 U	1 U	1 U	1 U	**260**	2 U
MW-67(30)	MTR-MW67(30)-G041610	04/16/10	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**66**	**50000**	20 U	40 UJ	20 U	**300**	**7.4 J**	**6300**	40 U
	MTR-MW67(30)-G041610R	04/16/10	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**81**	**48000**	20 U	40 UJ	20 U	**370**	**9.0 J**	**5400**	40 U
	MTR-MW67(30)-G081210	08/12/10	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**52 J**	**41000**	50 UJ	100 U	50 UJ	**270 J**	50 UJ	**8400 J**	100 U
	MTR-MW67(30)-G081210R	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**90 J**	**44000**	1 U	**1.8 J**	**3.5 J**	**530 J**	**2.2 J**	**14000 J**	2 U
	MTR-MW67(30)-G121310	12/13/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**20 J**	**9300**	10 U	20 U	10 U	**99**	10 U	**1400**	20 U
	MTR-MW67(30)-G121310R	12/13/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**22 J**	**11000**	10 U	20 U	10 U	**110**	10 U	**1800**	20 U
	MTR-MW67(30)-G033011	03/30/11	**29 J**	10 U	25 U	10 U	10 U	10 U	10 U	**12**	**5000**	10 U	20 U	10 U	**38**	10 U	**550**	20 U
	MTR-MW67(30)-G033011R	03/30/11	**23 J**	10 U	25 U	10 U	10 U	10 U	10 U	**13**	**6100**	10 U	20 U	10 U	**44**	10 U	**620**	20 U
	MTR-MW67(30)-G092911	09/29/11	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**24**	**15000**	20 U	40 U	20 U	**180**	20 U	**7400**	40 U
	MTR-MW67(30)-G092911R	09/29/11	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**20**	**15000**	20 U	40 U	20 U	**150**	20 U	**7400**	40 U
	ATR-MW67(30)-G041712	04/17/12	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**39**	**33000**	20 U	40 U	20 U	**130**	20 U	**5200**	40 U
	ATR-MW67(30)-G041712R	04/17/12	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**52**	**33000**	20 U	40 U	20 U	**160**	20 U	**4700**	40 U
	ATR-MW67(30)-G092612	09/26/12	400 U	20 U	50 U	20 U	20 U	20 U	20 U	20 U	**7900**	20 U	40 U	20 U	**69**	20 U	**870**	40 U
	ATR-MW67(30)-G050613	05/06/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	50 U	**21000**	50 U	100 U	50 U	**170**	50 U	**1800**	100 U
MW-68(32)	MTR-MW68(32)-G041610	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**50**	**23000**	1 U	**1.1 J**	1 U	**170 J**	**1.6**	**3100**	2 U
	MTR-MW68(32)-G081210	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**53**	**29000**	1 U	**0.61 J**	**2.0**	**280 J**	**1.2**	**11000**	2 U
	MTR-MW68(32)-G081210R	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**45**	**32000**	1 U	**0.56 J**	**1.4**	**530 J**	**1.0**	**9500**	2 U
	MTR-MW68(32)-G121310	12/13/10	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**48 J**	**13000**	20 U	40 U	20 U	**250**	20 U	**4100**	40 U
	MTR-MW68(32)-G033011	03/30/11	400 U	20 U	50 U	20 U	20 U	20 U	20 U	20 U	**11000**	20 U	40 U	20 U	**81**	20 U	**1400**	40 U
	MTR-MW68(32)-G092911	09/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**31**	**8700**	1 U	2 U	**0.77**	**64**	**2.7**	**2900**	2 U
	ATR-MW68(32)-G041712	04/17/12	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**37**	**34000**	10 U	20 U	10 U	**170**	10 U	**3400**	20 U
	ATR-MW68(32)-G050613	05/06/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	50 U	**28000**	50 U	100 U	50 U	**170**	50 U	**3000**	100 U

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Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW-71(33)	MTR-MW71(33)-G041610	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**20**	**8200**	1 U	2 UJ	**31**	**56**	**0.56 J**	**7600**	2 U
	MTR-MW71(33)-G041610R	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**20**	**7900**	1 U	2 UJ	**31**	**55**	**0.51 J**	**7800**	2 U
	MTR-MW71(33)-G081210	08/12/10	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**2100**	10 UJ	20 U	**15**	**7.6 J**	10 U	**6200**	20 U
	MTR-MW71(33)-G121310	12/13/10	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	50 U	**32000**	50 U	100 U	**54**	**210**	50 U	**16000**	100 U
	MTR-MW71(33)-G033011(4)	03/30/11	**140 J**	50 U	120 U	50 U	50 U	50 U	50 U	**150**	**74000**	50 U	100 U	**94**	**430**	50 U	**16000**	100 U
	MTR-MW71(33)-G092911	09/29/11	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**170**	**43000**	50 U	100 U	**96**	**400**	50 U	**15000**	100 U
	ATR-MW71(33)-G041712	04/17/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**81**	**54000**	50 U	100 U	**68**	**280**	50 U	**15000**	100 U
	ATR-MW71(33)-G050613	05/06/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	100 U	**38000**	100 U	200 U	**71**	**240**	100 U	**7500**	200 U
MW-72(32)	MTR-MW72(32)-G041610 (5)	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**270**	**64000**	1 U	**0.44 J**	**57**	**290**	**0.79 J**	**12000**	2 U
	MTR-MW72(32)-G041610R (5)	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**210**	**68000**	1 U	**0.58 J**	**58**	**280**	**0.97 J**	**11000**	2 U
	MTR-MW72(32)-G081210	08/12/10	4000 U	200 U	500 U	200 U	200 U	200 U	200 U	**160 J**	**60000**	200 UJ	400 U	200 U	200 U	200 U	**14000**	400 U
	MTR-MW72(32)-G121310	12/13/10	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**220 J**	**100000**	100 U	200 U	100 U	**280**	100 U	**23000**	200 U
	MTR-MW72(32)-G033011	03/30/11	20 U	**0.2 J**	2.5 U	1 U	1 U	1 U	1 U	**190**	**63000**	1 U	2 U	**57**	**230 J**	**1.0**	**7500**	2 U
	MTR-MW72(32)-G092911	09/29/11	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**96**	**20000**	20 U	40 U	**28**	**110**	20 U	**4800**	40 U
	ATR-MW72(32)-G041712	04/17/12	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**280**	**43000**	20 U	40 U	**46**	**260**	20 U	**7800**	40 U
	ATR-MW72(32)-G030613	03/06/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**390**	**87000**	100 U	200 U	100 U	**620**	100 U	**8300**	200 U
	ATR-MW72(32)-G050613	05/06/13	5000 U	250 U	620 U	250 U	250 U	250 U	250 U	**460**	**97000**	250 U	500 U	250 U	**720**	250 U	**11000**	500 U
MW-75(32)	MTR-MW75(32)-G041610	04/16/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 UJ	1 U	1 U	**6.3**	1 U	2 U
	MTR-MW75(32)-G081210	08/12/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	2 U	1 U	1 U	**5.2**	1 U	2 U
	MTR-MW75(32)-G121310	12/13/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**5.8**	1 U	2 U
	MTR-MW75(32)-G033011	03/30/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	**0.39 J**	1 U	**5.1**	1 U	2 U
	MTR-MW75(32)-G092911	09/29/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**3.0**	1 U	2 U
	ATR-MW75(32)-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**2.4**	1 U	2 U
	ATR-MW75(32)-G050613	05/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1.0 U	1 U	2 U
MW76(30)	ATR-MW76(30)-G030513	03/05/13	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**92**	19000	20 U	40 U	20 U	**210**	20 U	**4100**	40 U
	ATR-MW76(30)-G050613	05/06/13	400 U	20 U	50 U	20 U	20 U	20 U	20 U	20 U	7100	20 U	40 U	20 U	**49**	20 U	**650**	40 U
MW77(41)	ATR-MW77(41)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.0**	**550**	1 U	2 U	1 U	**4.4**	1 U	**84**	2 U
	ATR-MW77(41)-G050613	05/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**48**	1 U	2 U	1 U	1 U	1 U	**11**	2 U
MW78(35)	ATR-MW78(35)-G030513	03/05/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**8.2**	**2700**	5 U	10 U	5 U	**16**	5 U	**77**	10 U
	ATR-MW78(35)-G050613	05/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**360**	5 U	10 U	5 U	5 U	5 U	**540**	10 U
MW79(30)	ATR-MW79(30)-G030513	03/05/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**16**	**7400**	10 U	20 U	10 U	**40**	10 U	**3300**	20 U
	ATR-MW79(30)-G050613	05/06/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**3500**	10 U	20 U	10 U	**19**	10 U	**1900**	20 U
MW80(19)	ATR-MW80(19)-G020413	02/04/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW80(19)-G050213	05/02/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW81(27)	ATR-MW81(27)-G110512	11/05/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**270**	**40000**	50 U	100 U	**24**	**280**	**13000**	**3700**	100 U
	ATR-MW81(27)-G010713	01/07/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**250**	**50000**	50 U	100 U	**36**	**320**	**8800**	**7400**	100 U
	ATR-MW81(27)-G020513	02/05/13	2000 U	100 U	**64**	100 U	100 U	100 U	100 U	**410**	**47000**	100 U	200 U	100 U	**370**	**10000**	**7300**	200 U
	ATR-MW81(27)-G030613	03/06/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**420**	**53000**	50 U	100 U	**39**	**420**	**11000**	**6600**	100 U
	ATR-MW81(27)-G050213	05/02/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**440**	**46000**	100 U	200 U	100 U	**370**	**11000**	**6900**	200 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses Performed on the Groundwater Samples Collected through June 2013 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana (Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
MW81(45)	ATR-MW81(45)-G120512	12/05/12	100 U	5 U	12 U	5 U	5 U	**6.7**	5 U	**15**	**1800**	5 U	10 U	**14**	**10**	**950**	**150**	10 U
	ATR-MW81(45)-G120512R	12/05/12	100 U	5 U	12 U	5 U	5 U	**6.4**	5 U	**14**	**1800**	5 U	10 U	**14**	**11**	**970**	**160**	10 U
	ATR-MW81(45)-G030513	03/05/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**34**	**3900**	**3.2**	10 U	**23**	**28**	**2300**	**240**	10 U
	ATR-MW81(45)-G050213	05/02/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**27**	**3000**	10 U	20 U	**22**	**22**	**1600**	**180**	20 U
MW82(58)	ATR-MW82(58)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**13**	1 U	2 U	1 U	**1.7**	**8.4**	**9.9**	2 U
	ATR-MW82(58)-G050613	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**12**	1 U	2 U	1 U	1 U	**7.6**	**17**	2 U
MW83(64)	ATR-MW83(64)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW83(64)-G050613	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW84(44)	ATR-MW84(44)-G030413	03/04/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**8.4**	1 U	2 U
	ATR-MW84(44)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	**6.9**	1 U	2 U
MW84(68)	ATR-MW84(68)-G030413	03/04/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW84(68)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW85(130)	ATR-MW85(130)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW85(130)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW85(39)	ATR-MW85(39)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW85(39)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW85(70)	ATR-MW85(70)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW85(70)-050113	05/01/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
MW89(28)	ATR-MW89(28)-G030513	03/05/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW89(28)-G050613	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-MW89(28)-G050613R	05/07/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
PM1	ATR-PM1-G110512	11/05/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**50**	**39000**	50 U	100 U	**58**	**190**	**72**	**3400**	100 U
	ATR-PM1-G010713	01/07/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	50 U	**27000**	50 U	100 U	**46**	**160**	50 U	**5600**	100 U
	ATR-PM1-G020413	02/04/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**45**	**24000**	50 U	100 U	**36**	**150**	50 U	**4500**	100 U
	ATR-PM1-G030613	03/06/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**63**	**35000**	50 U	100 U	**50**	**220**	50 U	**5000**	100 U
	ATR-PM1-G030613R	03/06/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**67**	**34000**	50 U	100 U	50 U	**230**	50 U	**4600**	100 U
	ATR-PM1-G050313	05/03/13	4000 U	200 U	500 U	200 U	200 U	200 U	200 U	200 U	**49000**	200 U	400 U	200 U	200 U	200 U	**4600**	400 U
	ATR-PM1-G050313R	05/03/13	4000 U	200 U	500 U	200 U	200 U	200 U	200 U	200 U	**46000**	200 U	400 U	200 U	200 U	200 U	**4500**	400 U
PM2	ATR-PM2-G110512	11/05/12	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**94**	**13000**	**14**	40 U	**16**	**94**	**2000**	**4700**	**26**
	ATR-PM2-G010713	01/07/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**70**	**9200**	**8.6**	20 U	**11**	**67**	**660**	**4400**	20 U
	ATR-PM2-G020413	02/04/13	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**64**	**8500**	20 U	40 U	**8.6**	**61**	**400**	**3400**	40 U
	ATR-PM2-G030613	03/06/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	**79**	**8300**	10 U	20 U	10 U	**59**	**300**	**3100**	20 U
	ATR-PM2-G050313	05/03/13	400 U	20 U	50 U	20 U	20 U	20 U	20 U	**85**	**8600**	20 U	40 U	20 U	**67**	**610**	**3100**	40 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
PM3	ATR-PM3-G110512	11/05/12	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**200**	**43000**	50 U	100 U	**40**	**280**	**74**	**7600**	100 U
	ATR-PM3-G010713	01/07/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**270**	**44000**	50 U	100 U	**48**	**370**	50 U	**9700**	100 U
	ATR-PM3-G020413	02/04/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**340**	**46000**	100 U	200 U	**42**	**410**	100 U	**9900**	200 U
	ATR-PM3-G030513	03/05/13	1000 U	50 U	120 U	50 U	50 U	50 U	50 U	**390**	**44000**	50 U	100 U	**52**	**450**	50 U	**7100**	100 U
	ATR-PM3-G050213	05/02/13	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**340**	**37000**	100 U	200 U	**49**	**390**	100 U	**8300**	200 U
ZVI-1(16.5)	ATR-ZVI-1(16.5)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.0**	**740**	1 U	2 U	1 U	**14**	**3.5**	**180**	2 U
	ATR-ZVI-1(16.5)-G010813	01/08/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**770**	1 U	2 U	1 U	**11**	**3.2**	**250**	2 U
	ATR-ZVI-1(16.5)-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**710**	1 U	2 U	1 U	**10**	1 U	**170**	2 U
	ATR-ZVI-1(16.5)-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.0**	**790**	1 U	2 U	1 U	**8.7**	1 U	**210**	2 U
	ATR-ZVI-1(16.5)-G050313	05/03/13	200 U	10 U	25 U	10 U	10 U	10 U	10 U	10 U	**740**	10 U	20 U	10 U	10 U	10 U	**140**	20 U
ZVI-1(34.5)	ATR-ZVI-1(34.5)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.9**	**330**	1 U	2 U	1 U	**10**	**24**	**160**	2 U
	ATR-ZVI-1(34.5)-G010813	01/08/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.2**	**290**	1 U	2 U	1 U	**8.8**	**24**	**140**	2 U
	ATR-ZVI-1(34.5)-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**250**	1 U	2 U	1 U	**9.1**	**15**	**91**	2 U
	ATR-ZVI-1(34.5)-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**1.6**	**300**	1 U	2 U	1 U	**8.3**	**15**	**120**	2 U
	ATR-ZVI-1(34.5)-G050313	05/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.1**	**320**	1 U	2 U	1 U	**9.2**	**7.2**	**160**	2 U
ZVI-1(17.5)	ATR-ZVI-2(17.5)-G121812	12/18/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**2.3**	**1300**	1 U	2 U	1 U	**12**	**5.1**	**400**	2 U
	ATR-ZVI-2(17.5)-G010813	01/08/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1200**	5 U	10 U	5 U	**12**	5 U	**480**	10 U
	ATR-ZVI-2(17.5)-G030613	03/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1500**	5 U	10 U	5 U	**13**	5 U	**460**	10 U
	ATR-ZVI-2(17.5)-G040313	04/03/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1500**	5 U	10 U	5 U	**11**	5 U	**450**	10 U
	ATR-ZVI-2(17.5)-G050313	05/03/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	5 U	**1500**	5 U	10 U	5 U	**10**	5 U	**350**	10 U
ZVI-2(32.5)	ATR-ZVI-1(32.5)-G121812	12/18/12	**28**	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.9**	**580**	1 U	2 U	1 U	**10**	**16**	**210**	2 U
	ATR-ZVI-2(32.5)-G010813	01/08/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.2**	**670**	1 U	2 U	1 U	**13**	**3.2**	**280**	2 U
	ATR-ZVI-2(32.5)-G030613	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.6**	**650**	1 U	2 U	1 U	**16**	1 U	**280**	2 U
	ATR-ZVI-2(32.5)-G030613R	03/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**4.5**	**650**	1 U	2 U	1 U	**16**	1 U	**280**	2 U
	ATR-ZVI-2(32.5)-G040313	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.6**	**710**	1 U	2 U	1 U	**14**	1 U	**410**	2 U
	ATR-ZVI-2(32.5)-G040313R	04/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.5**	**710**	1 U	2 U	1 U	**14**	1 U	**410**	2 U
	ATR-ZVI-2(32.5)-G050313	05/03/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	**3.9**	**600**	1 U	2 U	1 U	**15**	1 U	**340**	2 U
INJ-1	ATR-INJ1-G112812	11/28/12	2000 U	100 U	250 U	100 U	100 U	100 U	100 U	**240**	**79000**	100 U	**190**	**180**	**400**	**35000**	**4600**	200 U
	ATR-INJ1-G030513	03/05/13	10000 U	500 U	1200 U	500 U	500 U	500 U	500 U	**650**	**400000**	500 U	1000 U	500 U	**1900**	**33000**	**14000**	1000 U
INJ2	ATR-INJ2-G030613	03/06/13	100 U	5 U	12 U	5 U	5 U	5 U	5 U	**28**	**5700**	**23**	10 U	**11**	**44**	**8.8**	**2400**	**28**
4377 NO HWY 31	MTR-4377NOHWY31-G121510	12/15/10	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-4377NOHWY31-G010511	01/05/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**0.45 J**	1 U	2 U	1 U	1 U	1 U	**1.4**	2 U
	MTR-4377NOHWY31-G032811	03/28/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	MTR-4377NOHWY31-G092311	09/23/11	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-4377NOHWY31-G041712	04/17/12	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	**1.5**	1 U	2 U	1 U	1 U	1 U	1 U	2 U
	ATR-4377NOHWY31-G050713	05/06/13	20 U	1 U	2.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U

Table 2-1

Comprehensive Summary of Volatile Organic Compound Analyses
Performed on the Groundwater Samples Collected through June 2013
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana
(Results reported in micrograms per liter, µg/L)

Monitoring Well Number	Field Sample ID	Sample Date[1]	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloroethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Ethyl benzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes, Total
	USEPA MCLs		NE	5.0	NE	100	NE	80	NE	7.0	70	700	5.0	1000	100	5.0	2.0	10000
	IDEM RISC Default Closure																	
	Industrial		92000	52	10000	2000	990	1000	10000	5100	1000	10000	55	8200	2000	31	4.0	20000
	Residential		6900	see MCL	1300	see MCL	62	see MCL	990	see MCL	see MCL	see MCL	see MCL	see MCL	see MCL	see MCL	see MCL	see MCL

Notes:

NA - Not analyzed	NE - None established
U - not detected, value is the detection limit	R - replicate sample
J - value is estimated	r - rejected value
N - uncertainty regarding result	H - additional analysis conducted on sample outside of hold time

USEPA MCLs - United States Environmental Protection Agency (USEPA) Maximum Contaminant Levels (MCLs) (May 2009)
IDEM RISC - Indiana Department of Environmental Management (IDEM) risk integrated system of closure (RISC) (05/01/09)
Xylene mixed (total) used as a surrogate for Xylene, m/p.
For a complete list of analyzed compounds and results please refer to the laboratory reports
Concentration exceeds IDEM RISC industrial default closure level
Concentration exceeds IDEM RISC residential default closure level and U.S. EPA maximum contaminant level

(1) 2-Butanone was detected at a concentration of 14 ug/l in the sample collected from MW-4 on 08/28/09

(2) MTR-MW22(130.7)-G050709 was mistakenly labeled as MTR-MW22(138.7)-G050709 on the Chain of Custody (COC)

(3) MTR-MW32(89)-G050609 was mistakenly labeled as MTR-MW32(82)-G050609 on the Chain of Custody (COC)

(4) Methylene Chloride (MC) was detected in the samples collected from MW-48(56) (0.45 J ug/l) and from MW48(105) (0.69 J ug/L) collected on 4/8/10 and 4/9/10, respectively; and in the samples collected from MW49(20) (1.3 J ug/l) and MW49(95) (0.56 J ug/l), both collected on 4/7/10. In March 2011, MC was detected in MTR-MW15-G032911R (3.4 ug/l), MTR-MW25(16.4)-G032911 (4.4 ug/l), MTR-MW59(29)-G033011 (15 ug/l), MTR-MW62(36)-G033011 (4.9 ug/l), MTR-MW67(30)-G032911R (8.2 ug/l), MTR-MW6C-G033011 (9.5 ug/l), and MTR-MW71(33)-G033011 (45 ug/l). In September 2011, MC was detected in MW59(29) at an estimated concentration of 22 ug/l.

(5) 1,2-Dichloroethane was detected at a concentration of 0.67 J and 0.71 J ug/l in the sample and its respective replicate sampled collected from MW-72(32) on 04/16/10.

(6) Chloromethane was detected at a concentration of 1.7 J ug/L in the sample MW59(29) collected on 5/11/10.

(7) Revised Monitoring Well Network approved by IDEM on September 22, 2010.

Prepared By: WDG
Checked By: RLB

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-1	04/05/10	840.48	38.25	802.23
	08/02/10		37.76	802.72
	12/06/10		39.18	801.30
	03/21/11		39.58	800.90
	09/19/11		38.27	802.21
	04/09/12		37.51	802.97
	12/17/12		39.91	800.57
	03/04/13		40.21	800.27
	04/29/13		39.05	801.43
MW-2	04/05/10	823.13	35.21	787.92
	08/02/10		35.04	788.09
	12/06/10		36.48	786.65
	03/21/11		36.13	787.00
	09/19/11		36.13	787.00
	04/09/12		44.63	778.50
	12/17/12		37.61	785.52
	03/04/13		37.31	785.82
	04/29/13		35.48	787.65
MW-3	04/05/10	805.45	19.81	785.64
	08/02/10		19.71	785.74
	12/06/10		20.88	784.57
	03/21/11		20.67	784.78
	09/19/11		20.36	785.09
	04/09/12		20.45	785.00
	12/17/12		21.78	783.67
	03/04/13		21.72	783.73
	04/29/13		20.61	784.84
MW-4	04/05/10	808.42	21.58	786.84
	08/02/10		21.29	787.13
	12/06/10		23.04	785.38
	03/21/11		22.68	785.74
	09/19/11		22.38	786.04
	04/09/12		20.95	787.47
	12/17/12		23.93	784.49
	03/04/13		23.82	784.60
	04/29/13		22.70	785.72
MW-5	04/05/10	807.89	19.80	788.09
	08/02/10		19.63	788.26
	12/06/10		19.62	788.27
	03/21/11		20.74	787.15
	09/19/11		20.77	787.12
	04/09/12		19.18	788.71
	12/17/12		22.21	785.68
	03/04/13		21.99	785.90
	04/29/13		20.10	787.79
MW-6B	04/05/10	810.49	26.92	783.57
	08/02/10	812.50	26.79	785.71
	12/06/10		25.88	786.62
	03/21/11		28.05	784.45
	09/19/11		27.46	785.04
	04/09/12		26.42	786.08
	12/17/12		28.81	783.69
	03/04/13		29.04	783.46
	04/29/13		28.31	784.19

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-6C	04/05/10	810.42	25.95	784.47
	08/02/10	811.43	25.92	785.51
	12/06/10		27.04	784.39
	03/21/11		26.83	784.60
	09/19/11		26.53	784.90
	04/09/12		25.61	785.82
	09/26/12		27.48	783.95
	12/17/12		27.95	783.48
	03/04/13		27.86	783.57
	04/29/13		26.75	784.68
MW-7	04/05/10	888.05	52.73	835.32
	08/02/10		52.00	836.05
	12/06/10		53.03	835.02
	03/21/11		53.77	834.28
	09/19/11		52.11	835.94
	04/09/12		51.91	836.14
	12/17/12		53.51	834.54
	03/04/13		54.06	833.99
	04/29/13		54.21	833.84
MW-8	04/05/10	805.62	18.41	787.21
	08/02/10		18.21	787.41
	12/06/10		19.68	785.94
	03/21/11		19.26	786.36
	09/19/11		19.09	786.53
	04/09/12		17.89	787.73
	12/17/12		20.67	784.95
	03/04/13		20.47	785.15
	04/29/13		18.91	786.71
MW-9A	04/05/10	808.06	24.37	783.69
	08/02/10		24.23	783.83
	12/06/10		25.45	782.61
	03/21/11		25.56	782.50
	09/19/11		24.78	783.28
	04/09/12		23.86	784.20
	12/17/12		26.36	781.70
	03/04/13		26.51	781.55
	04/29/13		25.71	782.35
MW-9B	04/05/10	808.07	22.61	785.46
	08/02/10		22.58	785.49
	12/06/10		23.71	784.36
	03/21/11		23.49	784.58
	09/19/11		23.18	784.89
	04/09/12		22.30	785.77
	12/17/12		24.64	783.43
	03/04/13		28.52	779.55
	04/29/13		23.39	784.68
MW-9C	04/05/10	808.16	22.70	785.46
	08/02/10		22.66	785.50
	12/06/10		23.80	784.36
	03/21/11		23.64	784.52
	09/19/11		23.27	784.89
	04/09/12		22.38	785.78
	12/17/12		24.72	783.44
	03/04/13		24.61	783.55
	04/29/13		23.51	784.65

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-10A	04/05/10	808.66	21.87	786.79
	08/02/10		21.71	786.95
	12/06/10		22.70	785.96
	03/21/11		23.00	785.66
	09/19/11		22.31	786.35
	04/09/12		21.39	787.27
	12/17/12		23.64	785.02
	03/04/13		23.98	784.68
	04/29/13		23.38	785.28
MW-10B	04/05/10	810.43	23.90	786.53
	08/02/10		23.72	786.71
	12/06/10		24.78	785.65
	03/21/11		25.00	785.43
	09/19/11		24.36	786.07
	04/09/12		23.38	787.05
	12/17/12		25.71	784.72
	03/04/13		27.99	782.44
	04/29/13		25.39	785.04
MW-10C	04/05/10	810.87	24.36	786.51
	08/02/10		24.26	786.61
	12/06/10		25.58	785.29
	03/21/11		25.21	785.66
	09/19/11		24.98	785.89
	04/09/12		23.81	787.06
	12/17/12		27.41	783.46
	03/04/13		26.25	784.62
	04/29/13		24.78	786.09
MW-11	04/05/10	809.41	24.02	785.39
	08/02/10		24.00	785.41
	12/06/10		NM	NM
	03/21/11		24.89	784.52
	09/19/11		24.56	784.85
	04/09/12		23.71	785.70
	12/17/12		26.01	783.40
	03/04/13		25.91	783.50
	04/29/13		24.82	784.59
MW-12	04/05/10	808.46	23.05	785.41
	08/02/10		23.05	785.41
	12/06/10		NM	NM
	03/21/11		23.93	784.53
	09/19/11		23.58	784.88
	04/09/12		22.75	785.71
	12/17/12		25.04	783.42
	03/04/13		24.94	783.52
	04/29/13		23.86	784.60
MW-13	04/05/10	806.70	21.34	785.36
	08/02/10		21.35	785.35
	12/06/10		NM	NM
	03/21/11		22.21	784.49
	09/19/11		22.91	783.79
	04/09/12		21.04	785.66
	09/27/12		22.88	783.82
	12/17/12		23.34	783.36
	03/04/13		23.23	783.47
	04/29/13		22.13	784.57

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation$^{(1)}$	Depth to Water (ftbtoc)$^{(2)}$	Ground Water Elevation
MW-14	04/05/10	802.70	17.52	785.18
	08/02/10		17.57	785.13
	12/06/10		18.58	784.12
	03/21/11		18.40	784.30
	09/19/11		10.08	792.62
	04/09/12		17.30	785.40
	09/27/12		19.05	783.65
	12/17/12		19.50	783.20
	03/04/13		19.42	783.28
	04/29/13		18.33	784.37
MW-15	04/05/10	792.90	8.58	784.32
	08/02/10		8.67	784.23
	12/06/10		9.56	783.34
	03/21/11		9.41	783.49
	09/19/11		9.09	783.81
	04/09/12		8.41	784.49
	12/17/12		10.51	782.39
	03/04/13		10.37	782.53
	04/29/13		9.36	783.54
MW-16	04/05/10	791.18	8.57	782.61
	08/02/10		8.69	782.49
	12/06/10		9.58	781.60
	03/21/11		9.36	781.82
	09/19/11		9.04	782.14
	04/09/12		8.45	782.73
	09/26/12		10.07	781.11
	11/27/12		10.77	780.41
	12/17/12		10.54	780.64
	01/08/13		10.68	780.50
	03/04/13		10.31	780.87
	04/03/13		10.25	780.93
	04/29/13		9.36	781.82
MW-17	04/05/10	784.41	2.22	782.19
	08/02/10		2.27	782.14
	12/06/10		3.28	781.13
	03/21/11		3.07	781.34
	09/19/11		2.64	781.77
	04/09/12		2.11	782.30
	09/26/12		3.67	780.74
	12/17/12		4.30	780.11
	03/04/13		4.08	780.33
	04/03/13		4.18	780.23
	04/29/13		3.13	781.28
MW-18(38.6)	04/05/10	826.66	38.60	788.06
	08/02/10		38.44	788.22
	12/06/10		40.02	786.64
	03/21/11		39.54	787.12
	09/19/11		39.56	787.10
	04/09/12		38.01	788.65
	12/17/12		Dry	Dry
	03/04/13		40.72	785.94
	04/29/13		38.74	787.92

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[(1)]	Depth to Water (ftbtoc)[(2)]	Ground Water Elevation
MW-18(63)	04/05/10	826.63	39.32	787.31
	08/02/10		39.21	787.42
	12/06/10		40.14	786.49
	03/21/11		40.52	786.11
	09/19/11		39.82	786.81
	04/09/12		38.85	787.78
	12/17/12		41.12	785.51
	03/04/13		41.48	785.15
	04/29/13		40.98	785.65
MW-18(164)	04/05/10	826.50	40.54	785.96
	08/02/10		40.36	786.14
	12/06/10		41.38	785.12
	03/21/11		41.71	784.79
	09/19/11		41.04	785.46
	04/09/12		40.01	786.49
	12/17/12		42.39	784.11
	03/04/13		42.71	783.79
	04/29/13		42.12	784.38
MW-19(33)	04/05/10	809.53	23.98	785.55
	08/02/10		24.01	785.52
	12/06/10		25.11	784.42
	03/21/11		24.89	784.64
	09/19/11		24.56	784.97
	04/09/12		23.67	785.86
	12/17/12		26.01	783.52
	03/04/13		25.93	783.60
	04/29/13		24.81	784.72
MW-19(53)	04/05/10	809.56	24.00	785.56
	08/02/10		24.02	785.54
	12/06/10		25.02	784.54
	03/21/11		24.90	784.66
	09/19/11		24.58	784.98
	04/09/12		23.68	785.88
	12/17/12		26.02	783.54
	03/04/13		25.93	783.63
	04/29/13		24.82	784.74
MW-19(118)	04/05/10	809.56	23.84	785.72
	08/02/10		23.74	785.82
	12/06/10		24.81	784.75
	03/21/11		25.01	784.55
	09/19/11		24.44	785.12
	04/09/12		23.31	786.25
	12/17/12		25.69	783.87
	03/04/13		25.96	783.60
	04/29/13		25.29	784.27
MW-20(35)	04/05/10	810.42	24.92	785.50
	08/02/10		24.92	785.50
	12/06/10		26.02	784.40
	03/21/11		25.82	784.60
	09/19/11		25.54	784.88
	04/09/12		24.62	785.80
	12/17/12		26.95	783.47
	03/04/13		26.86	783.56
	04/29/13		25.75	784.67

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-20(51)	04/05/10	810.41	24.91	785.50
	08/02/10		24.62	785.79
	12/06/10		26.08	784.33
	03/21/11		25.82	784.59
	09/19/11		25.49	784.92
	04/09/12		24.61	785.80
	12/17/12		26.96	783.45
	03/04/13		26.86	783.55
	04/29/13		25.75	784.66
MW-20(124)	04/05/10	810.45	26.41	784.04
	08/02/10		26.31	784.14
	12/06/10		27.46	782.99
	03/21/11		27.61	782.84
	09/19/11		27.14	783.31
	04/09/12		25.90	784.55
	12/17/12		28.41	782.04
	03/04/13		28.58	781.87
	04/29/13		27.79	782.66
MW-20(155)	04/05/10	810.44	26.15	784.29
	08/02/10		26.04	784.40
	12/06/10		27.19	783.25
	03/21/11		27.33	783.11
	09/19/11		26.77	783.67
	04/09/12		25.57	784.87
	12/17/12		28.11	782.33
	03/04/13		28.23	782.21
	04/29/13		27.49	782.95
MW-21(40.2)	04/05/10	810.33	25.07	785.26
	08/02/10		25.02	785.31
	12/06/10		26.18	784.15
	03/21/11		25.95	784.38
	09/19/11		25.64	784.69
	04/09/12		24.74	785.59
	12/17/12		27.08	783.25
	03/04/13		26.99	783.34
	04/29/13		25.93	784.40
MW-21(128)	04/05/10	810.30	26.76	783.54
	08/02/10		26.61	783.69
	12/06/10		29.91	780.39
	03/21/11		27.97	782.33
	09/19/11		27.54	782.76
	04/09/12		26.28	784.02
	12/17/12		28.79	781.51
	03/04/13		28.93	781.37
	04/29/13		28.12	782.18
MW-21(155.3)	04/05/10	810.35	26.71	783.64
	08/02/10		26.54	783.81
	12/06/10		27.81	782.54
	03/21/11		27.90	782.45
	09/19/11		27.44	782.91
	04/09/12		26.20	784.15
	12/17/12		28.71	781.64
	03/04/13		28.86	781.49
	04/29/13		20.05	790.30

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-22(37)	04/05/10	803.92	19.85	784.07
	08/02/10		19.76	784.16
	12/06/10		20.93	782.99
	03/21/11		21.02	782.90
	09/19/11		20.32	783.60
	04/09/12		19.88	784.04
	12/17/12		21.76	782.16
	03/04/13		21.96	781.96
	04/29/13		21.23	782.69
MW-22(67.7)	04/05/10	803.94	19.87	784.07
	08/02/10		19.81	784.13
	12/06/10		20.98	782.96
	03/21/11		21.05	782.89
	09/19/11		20.34	783.60
	04/09/12		19.31	784.63
	12/17/12		21.81	782.13
	03/04/13		21.98	781.96
	04/29/13		21.25	782.69
MW-22(130.7)	04/05/10	803.95	19.95	784.00
	08/02/10		19.86	784.09
	12/06/10		22.98	780.97
	03/21/11		21.10	782.85
	09/19/11		20.44	783.51
	04/09/12		19.40	784.55
	12/17/12		21.86	782.09
	03/04/13		22.01	781.94
	04/29/13		21.34	782.61
MW-23(39.9)	04/05/10	816.67	30.88	785.79
	08/02/10		30.92	785.75
	12/06/10		31.98	784.69
	03/21/11		31.88	784.79
	09/19/11		31.47	785.20
	04/09/12		30.51	786.16
	12/17/12		33.01	783.66
	03/04/13		32.95	783.72
	04/29/13		31.80	784.87
MW-23(105.6)	04/05/10	816.65	30.69	785.96
	08/02/10		30.69	785.96
	12/06/10		31.83	784.82
	03/21/11		31.68	784.97
	09/19/11		31.30	785.35
	04/09/12		30.31	786.34
	12/17/12		32.82	783.83
	03/04/13		32.76	783.89
	04/29/13		31.58	785.07
MW-23(122.7)	04/05/10	816.69	38.59	778.10
	08/02/10		36.98	779.71
	12/06/10		33.19	783.50
	03/21/11		31.63	785.06
	09/19/11		31.31	785.38
	04/09/12		30.27	786.42
	12/17/12		32.78	783.91
	03/04/13		32.71	783.98
	04/29/13		31.55	785.14

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-24(24.9)	04/05/10	804.92	19.79	785.13
	08/02/10		19.88	785.04
	12/06/10		20.86	784.06
	03/21/11		20.67	784.25
	09/19/11		20.37	784.55
	04/09/12		19.57	785.35
	12/17/12		21.76	783.16
	03/04/13		21.66	783.26
	04/29/13		20.59	784.33
MW-24(55.4)	04/05/10	804.94	19.77	785.17
	08/02/10		19.86	785.08
	12/06/10		20.91	784.03
	03/21/11		20.65	784.29
	09/19/11		20.34	784.60
	04/09/12		19.54	785.40
	12/17/12		21.41	783.53
	03/04/13		21.64	783.30
	04/29/13		20.59	784.35
MW-24(122.6)	04/05/10	804.93	21.12	783.81
	08/02/10		20.98	783.95
	12/06/10		23.26	781.67
	03/21/11		22.30	782.63
	09/19/11		21.64	783.29
	04/09/12		20.63	784.30
	12/17/12		23.09	781.84
	03/04/13		23.30	781.63
	04/29/13		22.55	782.38
MW-24(159.4)	04/05/10	804.93	21.02	783.91
	08/02/10		20.81	784.12
	12/06/10		22.09	782.84
	03/21/11		22.20	782.73
	09/19/11		21.58	783.35
	04/09/12		20.52	784.41
	12/17/12		23.02	781.91
	03/04/13		23.23	781.70
	04/29/13		22.45	782.48
MW-25(16.4)	04/05/10	791.93	7.27	784.66
	08/02/10		7.39	784.54
	12/06/10		8.29	783.64
	03/21/11		8.10	783.83
	09/19/11		7.83	784.10
	04/09/12		7.11	784.82
	09/27/12		5.42	786.51
	12/17/12		9.17	782.76
	03/04/13		6.04	785.89
	04/29/13		8.03	783.90
MW-25(32.6)	04/05/10	791.92	7.28	784.64
	08/02/10		7.36	784.56
	12/06/10		8.33	783.59
	03/21/11		8.12	783.80
	09/19/11		7.84	784.08
	04/09/12		7.11	784.81
	12/17/12		9.21	782.71
	03/04/13		6.09	785.83
	04/29/13		8.06	783.86

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-25(45.2)	04/05/10	791.91	7.59	784.32
	08/02/10		7.71	784.20
	12/06/10		8.64	783.27
	03/21/11		8.43	783.48
	09/19/11		8.12	783.79
	04/09/12		7.43	784.48
	12/17/12		9.53	782.38
	03/04/13		9.38	782.53
	04/29/13		8.39	783.52
MW-25(82)	04/05/10	791.93	8.32	783.61
	08/02/10		8.19	783.74
	12/06/10		9.44	782.49
	03/21/11		9.52	782.41
	09/19/11		8.82	783.11
	04/09/12		7.87	784.06
	12/17/12		10.31	781.62
	03/04/13		10.53	781.40
	04/29/13		9.77	782.16
MW-25(145)	04/05/10	791.91	8.39	783.52
	08/02/10		8.25	783.66
	12/06/10		9.54	782.37
	03/21/11		9.61	782.30
	09/19/11		8.88	783.03
	04/09/12		8.95	782.96
	12/17/12		10.39	781.52
	03/04/13		10.57	781.34
	04/29/13		9.82	782.09
MW-26(17.5)	04/05/10	792.16	9.67	782.49
	08/02/10		9.78	782.38
	12/06/10		10.65	781.51
	03/21/11		10.45	781.71
	09/19/11		10.13	782.03
	04/09/12		9.56	782.60
	09/27/12		11.17	780.99
	11/27/12		11.47	780.69
	12/17/12		11.56	780.60
	01/08/13		11.65	780.51
	03/04/13		11.41	780.75
	04/03/13		11.33	780.83
	04/29/13		10.46	781.70
MW-26(28.8)	04/05/10	792.14	9.58	782.56
	08/02/10		9.68	782.46
	12/06/10		10.56	781.58
	03/21/11		10.36	781.78
	09/19/11		10.07	782.07
	04/09/12		9.45	782.69
	09/27/12		11.07	781.07
	12/17/12		11.56	780.58
	01/08/13		11.74	780.40
	03/04/13		11.34	780.80
	04/03/13		11.25	780.89
	04/29/13		10.37	781.77

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-26(58.2)	04/05/10	792.17	9.04	783.13
	08/02/10		6.12	786.05
	12/06/10		10.06	782.11
	03/21/11		9.87	782.30
	09/19/11		9.54	782.63
	04/09/12		8.90	783.27
	12/17/12		11.03	781.14
	03/04/13		10.66	781.51
	04/29/13		9.86	782.31
MW-26(114.8)	04/05/10	792.15	8.81	783.34
	08/02/10		5.67	786.48
	12/06/10		9.97	782.18
	03/21/11		10.02	782.13
	09/19/11		9.32	782.83
	04/09/12		8.38	783.77
	12/17/12		10.83	781.32
	03/04/13		11.02	781.13
	04/29/13		10.23	781.92
MW-26(143.6)	04/05/10	792.17	8.82	783.35
	08/02/10		5.69	786.48
	12/06/10		9.97	782.20
	03/21/11		10.04	782.13
	09/19/11		9.32	782.85
	04/09/12		8.39	783.78
	12/17/12		10.86	781.31
	03/04/13		11.02	781.15
	04/29/13		10.24	781.93
MW-27(18)	04/05/10	785.82	3.57	782.25
	08/02/10		2.67	783.15
	12/06/10		4.55	781.27
	03/21/11		4.36	781.46
	09/19/11		3.99	781.83
	04/09/12		3.50	782.32
	12/17/12		5.54	780.28
	03/04/13		5.39	780.43
	04/29/13		4.46	781.36
MW-27(53.05)	04/05/10	785.84	2.69	783.15
	08/02/10		2.77	783.07
	12/06/10		3.69	782.15
	03/21/11		3.52	782.32
	09/19/11		3.14	782.70
	04/09/12		2.61	783.23
	12/17/12		4.64	781.20
	03/04/13		4.49	781.35
	04/29/13		3.53	782.31
MW-27(75.4)	04/05/10	785.88	2.59	783.29
	08/02/10		2.66	783.22
	12/06/10		3.62	782.26
	03/21/11		3.43	782.45
	09/19/11		3.07	782.81
	04/09/12		2.49	783.39
	12/17/12		4.56	781.32
	03/04/13		4.41	781.47
	04/29/13		3.43	782.45

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-27(104.2)	04/05/10	785.84	2.49	783.35
	08/02/10		2.33	783.51
	12/06/10		3.62	782.22
	03/21/11		3.71	782.13
	09/19/11		2.98	782.86
	04/09/12		2.07	783.77
	12/17/12		4.48	781.36
	03/04/13		4.69	781.15
	04/29/13		3.88	781.96
MW-27(135)	04/05/10	785.85	2.49	783.36
	08/02/10		2.34	783.51
	12/06/10		3.62	782.23
	03/21/11		3.72	782.13
	09/19/11		3.02	782.83
	04/09/12		2.08	783.77
	12/17/12		4.51	781.34
	03/04/13		4.71	781.14
	04/29/13		3.88	781.97
MW-28(24.3)	04/05/10	790.47	9.42	781.05
	08/02/10		6.39	784.08
	12/06/10		10.71	779.76
	03/21/11		10.43	780.04
	09/19/11		9.87	780.60
	04/09/12		9.27	781.20
	12/17/12		11.91	778.56
	03/04/13		11.63	778.84
	04/29/13		10.49	779.98
MW-28(53.2)	04/05/10	790.58	9.16	781.42
	08/02/10		9.13	781.45
	12/06/10		10.36	780.22
	03/21/11		10.15	780.43
	09/19/11		9.61	780.97
	04/09/12		8.97	781.61
	12/17/12		11.56	779.02
	03/04/13		11.30	779.28
	04/29/13		10.21	780.37
MW-28(117.7)	04/05/10	790.57	5.35	785.22
	08/02/10		5.38	785.19
	12/06/10		6.43	784.14
	03/21/11		6.29	784.28
	09/19/11		5.91	784.66
	04/09/12		5.06	785.51
	12/17/12		7.38	783.19
	03/04/13		7.29	783.28
	04/29/13		6.22	784.35
MW-28(138.1)	04/05/10	790.59	8.45	782.14
	08/02/10		8.41	782.18
	12/06/10		9.81	780.78
	03/21/11		9.65	780.94
	09/19/11		9.07	781.52
	04/09/12		8.05	782.54
	12/17/12		10.96	779.63
	03/04/13		10.94	779.65
	04/29/13		9.85	780.74

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-29(82.5)	04/05/10	801.45	23.79	777.66
	08/02/10		23.59	777.86
	12/06/10		25.59	775.86
	03/21/11		25.15	776.30
	09/19/11		27.03	774.42
	04/09/12		23.39	778.06
	12/17/12		27.02	774.43
	03/04/13		26.56	774.89
	04/29/13		25.29	776.16
MW-29(103.3)	04/05/10	801.45	26.43	775.02
	08/02/10		26.33	775.12
	12/06/10		28.09	773.36
	03/21/11		27.42	774.03
	09/19/11		27.01	774.44
	04/09/12		25.99	775.46
	12/17/12		29.41	772.04
	03/04/13		28.81	772.64
	04/29/13		27.36	774.09
MW-29(132.8)	04/05/10	801.47	26.34	775.13
	08/02/10		26.33	775.14
	12/06/10		28.09	773.38
	03/21/11		27.44	774.03
	09/19/11		27.04	774.43
	04/09/12		26.00	775.47
	12/17/12		29.46	772.01
	03/04/13		28.81	772.66
	04/29/13		27.36	774.11
MW-30(41.1)	04/05/10	794.57	18.21	776.36
	08/02/10		18.11	776.46
	12/06/10		20.28	774.29
	03/21/11		19.79	774.78
	09/19/11		18.84	775.73
	04/09/12		18.00	776.57
	12/17/12		21.95	772.62
	03/04/13		21.56	773.01
	04/29/13		19.91	774.66
MW-30(120.2)	04/05/10	794.57	11.46	783.11
	08/02/10		11.31	783.26
	12/06/10		12.57	782.00
	03/21/11		12.64	781.93
	09/19/11		12.05	782.52
	04/09/12		11.02	783.55
	12/17/12		13.44	781.13
	03/04/13		13.66	780.91
	04/29/13		12.81	781.76
MW-30(148)	04/05/10	794.58	32.45	762.13
	08/02/10		33.11	761.47
	12/06/10		33.72	760.86
	03/21/11		32.80	761.78
	09/19/11		33.68	760.90
	04/09/12		32.29	762.29
	12/17/12		34.40	760.18
	03/04/13		33.61	760.97
	04/29/13		31.99	762.59

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-31(30.9)	04/05/10	781.48	7.48	774.00
	08/02/10		7.41	774.07
	12/06/10		9.65	771.83
	03/21/11		8.69	772.79
	09/19/11		8.09	773.39
	04/09/12		7.36	774.12
	12/17/12		11.35	770.13
	03/04/13		10.61	770.87
	04/29/13		8.58	772.90
MW-31(55.5)	04/05/10	781.47	7.90	773.57
	08/02/10		7.86	773.61
	12/06/10		9.98	771.49
	03/21/11		9.06	772.41
	09/19/11		5.56	775.91
	04/09/12		7.77	773.70
	12/17/12		11.61	769.86
	03/04/13		10.91	770.56
	04/29/13		8.91	772.56
MW-31(98.5)	04/05/10	781.46	14.42	767.04
	08/02/10		15.02	766.44
	12/06/10		15.80	765.66
	03/21/11		15.02	766.44
	09/19/11		15.51	765.95
	04/09/12		14.18	767.28
	12/17/12		16.65	764.81
	03/04/13		15.81	765.65
	04/29/13		14.15	767.31
MW-31(139.2)	04/05/10	781.48	20.29	761.19
	08/02/10		21.01	760.47
	12/06/10		21.55	759.93
	03/21/11		20.60	760.88
	09/19/11		21.56	759.92
	04/09/12		20.19	761.29
	12/17/12		22.38	759.10
	03/04/13		21.52	759.96
	04/29/13		19.83	761.65
MW-32(24.1)	04/05/10	787.80	19.49	768.31
	08/02/10		19.71	768.09
	12/06/10		21.28	766.52
	03/21/11		20.64	767.16
	09/19/11		20.22	767.58
	04/09/12		19.31	768.49
	12/17/12		22.37	765.43
	04/29/13		19.79	768.01
MW-32(89)	04/05/10	787.85	34.25	753.60
	08/02/10		34.74	753.11
	12/06/10		35.36	752.49
	03/21/11		34.36	753.49
	09/19/11		35.46	752.39
	04/09/12		34.31	753.54
	12/17/12		35.97	751.88
	04/29/13		33.21	754.64

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-32(110)	04/05/10	787.82	34.34	753.48
	08/02/10		34.74	753.08
	12/06/10		35.34	752.48
	03/21/11		34.38	753.44
	09/19/11		35.44	752.38
	04/09/12		34.31	753.51
	12/17/12		35.97	751.85
	04/29/13		33.22	754.60
MW-33(23.1)	04/05/10	795.11	9.69	785.42
	08/02/10		9.84	785.27
	12/06/10		11.58	783.53
	03/21/11		10.60	784.51
	09/19/11		9.98	785.13
	04/09/12		8.72	786.39
	12/17/12		12.52	782.59
	04/29/13		9.68	785.43
MW-33(70.9)	04/05/10	795.09	41.77	753.32
	08/02/10		42.27	752.82
	12/06/10		42.89	752.20
	03/21/11		41.84	753.25
	09/19/11		43.04	752.05
	04/09/12		41.78	753.31
	12/17/12		43.46	751.63
	04/29/13		40.74	754.35
MW-33(129.1)	04/05/10	794.95	41.64	753.31
	08/02/10		42.16	752.79
	12/06/10		43.79	751.16
	03/21/11		41.71	753.24
	09/19/11		42.91	752.04
	04/09/12		41.65	753.30
	12/17/12		43.31	751.64
	04/29/13		40.64	754.31
MW-33(208.9)	04/05/10	794.93	37.52	757.41
	08/02/10		38.02	756.91
	12/06/10		38.64	756.29
	03/21/11		37.72	757.21
	09/19/11		38.65	756.28
	04/09/12		37.36	757.57
	12/17/12		39.23	755.70
	04/29/13		36.88	758.05
MW-34(37)	04/05/10	777.60	24.21	753.39
	08/02/10		24.44	753.16
	12/06/10		25.34	752.26
	03/21/11		24.33	753.27
	09/19/11		25.43	752.17
	04/09/12		24.33	753.27
	12/17/13		25.94	751.66
	04/29/13		23.19	754.41

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-34(85)	04/05/10	777.54	24.21	753.33
	08/02/10		24.71	752.83
	12/06/10		25.30	752.24
	03/21/11		24.34	753.20
	09/19/11		25.43	752.11
	04/09/12		24.31	753.23
	12/17/12		25.90	751.64
	04/29/13		23.18	754.36
MW-34(110)	04/05/10	777.58	24.24	753.34
	08/02/10		24.45	753.13
	12/06/10		25.35	752.23
	03/21/11		24.36	753.22
	09/19/11		25.45	752.13
	04/09/12		24.28	753.30
	12/17/12		25.95	751.63
	04/29/13		23.23	754.35
MW-34(135)	04/05/10	777.57	24.21	753.36
	08/02/10		24.41	753.16
	12/06/10		25.32	752.25
	03/21/11		24.31	753.26
	09/19/11		25.43	752.14
	04/09/12		24.32	753.25
	12/17/12		25.90	751.67
	04/29/13		22.18	755.39
MW-35(45)	04/05/10	781.38	28.21	753.17
	08/02/10		28.71	752.67
	12/06/10		29.32	752.06
	03/21/11		28.25	753.13
	09/19/11		29.45	751.93
	04/09/12		28.22	753.16
	12/17/12		29.91	751.47
	04/29/13		27.18	754.20
MW-35(90)	04/05/10	781.37	28.21	753.16
	08/02/10		28.71	752.66
	12/06/10		29.28	752.09
	03/21/11		28.24	753.13
	09/19/11		29.42	751.95
	04/09/12		28.21	753.16
	12/17/12		29.88	751.49
	04/29/13		27.12	754.25
MW-35(148)	04/05/10	781.34	28.16	753.18
	08/02/10		28.68	752.66
	12/06/10		29.29	752.05
	03/21/11		28.20	753.14
	09/19/11		29.37	751.97
	04/09/12		28.18	753.16
	12/17/12		29.85	751.49
	04/29/13		27.18	754.16

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-36(35.2)	04/05/10	770.03	17.05	752.98
	08/02/10		17.53	752.50
	12/06/10		18.20	751.83
	03/21/11		17.11	752.92
	09/19/11		18.20	751.83
	04/09/12		17.08	752.95
	12/17/12		18.70	751.33
	04/29/13		16.02	754.01
MW-36(92.4)	04/05/10	770.06	17.10	752.96
	08/02/10		17.60	752.46
	12/06/10		18.20	751.86
	03/21/11		17.11	752.95
	09/19/11		18.31	751.75
	04/09/12		17.12	752.94
	12/17/12		18.78	751.28
	04/29/13		16.01	754.05
MW-36(124.5)	04/05/10	770.09	17.09	753.00
	08/02/10		17.59	752.50
	12/06/10		18.20	751.89
	03/21/11		17.11	752.98
	09/19/11		18.31	751.78
	04/09/12		17.12	752.97
	12/17/12		18.78	751.31
	04/29/13		16.02	754.07
MW-37(23.3)	04/05/10	757.91	9.39	748.52
	08/02/10		9.82	748.09
	12/06/10		9.76	748.15
	03/21/11		9.37	748.54
	09/19/11		10.32	747.59
	04/09/12		9.60	748.31
	12/17/12		10.27	747.64
	04/29/13		8.24	749.67
MW-37(70)	04/05/10	758.02	6.81	751.21
	08/02/10		7.46	750.56
	12/06/10		7.98	750.04
	03/21/11		6.67	751.35
	09/19/11		8.22	749.80
	04/09/12		6.92	751.10
	12/17/12		5.55	752.47
	04/29/13		5.11	752.91
MW-37(98)	04/05/10	758.04	6.81	751.23
	08/02/10		7.45	750.59
	12/06/10		7.99	750.05
	03/21/11		6.68	751.36
	09/19/11		8.22	749.82
	04/09/12		6.95	751.09
	12/17/12		5.56	752.48
	04/29/13		5.16	752.88

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW-38(20.8)	04/05/10	758.49	6.83	751.66
	08/02/10		7.34	751.15
	12/06/10		7.74	750.75
	03/21/11		6.79	751.70
	09/19/11		7.98	750.51
	04/09/12		6.95	751.54
	12/17/12		8.25	750.24
	04/29/13		5.82	752.67
MW-38(29.1)	04/05/10	758.49	6.83	751.66
	08/02/10		7.34	751.15
	12/06/10		7.73	750.76
	03/21/11		6.79	751.70
	09/19/11		7.99	750.50
	04/09/12		6.95	751.54
	12/17/12		5.24	753.25
	04/29/13		5.81	752.68
MW-38(69.9)	04/05/10	758.48	6.24	752.24
	08/02/10		6.78	751.70
	12/06/10		7.36	751.12
	03/21/11		6.20	752.28
	09/19/11		7.54	750.94
	04/09/12		6.31	752.17
	12/17/12		7.94	750.54
	04/29/13		4.96	753.52
MW-38(102.5)	04/05/10	758.50	6.24	752.26
	08/02/10		6.79	751.71
	12/06/10		7.37	751.13
	03/21/11		6.20	752.30
	09/19/11		7.51	750.99
	04/09/12		6.31	752.19
	12/17/12		7.95	750.55
	04/29/13		4.98	753.52
MW-39(13)	04/05/10	754.88	3.99	750.89
	08/02/10		4.46	750.42
	12/06/10		4.66	750.22
	03/21/11		3.96	750.92
	09/19/11		4.94	749.94
	04/09/12		7.15	747.73
	12/17/12		5.15	749.73
	04/29/13		3.10	751.78
MW-39(29.3)	04/05/10	754.91	3.43	751.48
	08/02/10		4.22	750.69
	12/06/10		4.54	750.37
	03/21/11		3.68	751.23
	09/19/11		4.79	750.12
	04/09/12		3.87	751.04
	12/17/12		5.05	749.86
	04/29/13		2.69	752.22

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW-39(76.8)	04/05/10	754.87	3.73	751.14
	08/02/10		4.08	750.79
	12/06/10		4.62	750.25
	03/21/11		3.33	751.54
	09/19/11		4.83	750.04
	04/09/12		3.57	751.30
	12/17/12		5.19	749.68
	04/29/13		1.85	753.02
MW-40 (198.8)	04/05/10	826.19	40.66	785.53
	08/02/10		40.48	785.71
	12/06/10		41.61	784.58
	03/21/11		41.83	784.36
	09/19/11		41.14	785.05
	04/09/12		40.20	785.99
	12/17/12		42.63	783.56
	03/04/13		42.94	783.25
	04/29/13		42.28	783.91
MW-41 (190)	04/05/10	810.19	26.63	783.56
	08/02/10		26.42	783.77
	12/06/10		27.98	782.21
	03/21/11		27.96	782.23
	09/19/11		27.39	782.80
	04/09/12		26.08	784.11
	12/17/12		29.64	780.55
	03/04/13		29.01	781.18
	04/29/13		28.00	782.19
MW-42 (175.3)	04/05/10	793.89	9.04	784.85
	08/02/10		5.56	788.33
	12/06/10		10.02	783.87
	03/21/11		10.19	783.70
	09/19/11		9.38	784.51
	04/09/12		8.51	785.38
	12/17/12		10.94	782.95
	03/04/13		11.25	782.64
	04/29/13		10.61	783.28
MW-43 (190)	04/05/10	809.62	25.76	783.86
	08/02/10		25.60	784.02
	12/06/10		27.01	782.61
	03/21/11		27.11	782.51
	09/19/11		26.61	783.01
	04/09/12		25.34	784.28
	12/17/12		27.91	781.71
	03/04/13		28.24	781.38
	04/29/13		27.26	782.36
MW-44 (185.9)	04/05/10	804.02	21.61	782.41
	08/02/10		21.28	782.74
	12/06/10		22.64	781.38
	03/21/11		22.75	781.27
	09/19/11		23.16	780.86
	04/09/12		21.14	782.88
	12/17/12		23.68	780.34
	03/04/13		23.88	780.14
	04/29/13		23.00	781.02

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[(1)]	Depth to Water (ftbtoc)[(2)]	Ground Water Elevation
MW-45 (185)	04/05/10	810.22	26.81	783.41
	08/02/10		26.65	783.57
	12/06/10		28.02	782.20
	03/21/11		28.11	782.11
	09/19/11		27.61	782.61
	04/09/12		26.35	783.87
	12/17/12		28.96	781.26
	03/04/13		29.11	781.11
	04/29/13		28.21	782.01
MW-46 (95.5)	04/05/10	814.41	58.50	755.91
	08/02/10		58.98	755.43
	12/06/10		59.62	754.79
	03/21/11		58.67	755.74
	09/19/11		59.67	754.74
	04/09/12		58.41	756.00
	12/17/12		60.21	754.20
	04/29/13		57.83	756.58
MW-47(109.7)	04/05/10	818.47	36.85	781.62
	08/02/10		36.64	781.83
	12/06/10		37.18	781.29
	03/21/11		38.00	780.47
	09/19/11		37.33	781.14
	04/09/12		36.35	782.12
	12/17/12		38.78	779.69
	04/29/13		38.13	780.34
MW-47(137.8)	04/05/10	818.46	37.79	780.67
	08/02/10		36.55	781.91
	12/06/10		37.78	780.68
	03/21/11		37.94	780.52
	09/19/11		37.28	781.18
	04/09/12		36.26	782.20
	12/17/12		38.70	779.76
	04/29/13		38.08	780.38
MW48(56)	04/05/10	806.85	24.86	781.99
	08/02/10		24.82	782.03
	12/06/10		26.07	780.78
	03/21/11		25.89	780.96
	09/19/11		25.31	781.54
	04/09/12		24.64	782.21
	12/17/12		27.21	779.64
	03/04/13		26.96	779.89
	04/29/13		25.90	780.95
MW48(105)	04/05/10	806.92	26.28	780.64
	08/02/10		26.11	780.81
	12/06/10		27.67	779.25
	03/21/11		27.47	779.45
	09/19/11		26.64	780.28
	04/09/12		25.03	781.89
	12/17/12		28.89	778.03
	03/04/13		28.61	778.31
	04/29/13		27.54	779.38

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[(1)]	Depth to Water (ftbtoc)[(2)]	Ground Water Elevation
MW48(129)	04/05/10	806.93	26.27	780.66
	08/02/10		26.14	780.79
	12/06/10		27.69	779.24
	03/21/11		27.49	779.44
	09/19/11		26.63	780.30
	04/09/12		25.84	781.09
	12/17/12		28.92	778.01
	03/04/13		28.61	778.32
	04/29/13		27.56	779.37
MW48(159)	04/05/10	806.93	24.77	782.16
	08/02/10		24.76	782.17
	12/06/10		26.18	780.75
	03/21/11		25.99	780.94
	09/19/11		25.44	781.49
	04/09/12		24.41	782.52
	12/17/12		27.31	779.62
	03/04/13		27.28	779.65
	04/29/13		26.20	780.73
MW49(20)	04/05/10	792.30	11.88	780.42
	08/02/10		11.68	780.62
	12/06/10		13.52	778.78
	03/21/11		13.05	779.25
	09/19/11		12.46	779.84
	04/09/12		11.50	780.80
	12/17/12		14.73	777.57
	03/04/13		14.31	777.99
	04/29/13		12.62	779.68
MW49(45)	04/05/10	792.24	8.80	783.44
	08/02/10		5.85	786.39
	12/06/10		10.12	782.12
	03/21/11		9.76	782.48
	09/19/11		9.38	782.86
	04/09/12		8.32	783.92
	12/17/12		10.95	781.29
	03/04/13		10.88	781.36
	04/29/13		9.32	782.92
MW49(95)	04/05/10	792.12	9.31	782.81
	12/06/10		10.12	782.00
	08/02/10		5.85	786.27
	03/21/11		10.22	781.90
	09/19/11		9.62	782.50
	04/09/12		8.60	783.52
	12/17/12		11.01	781.11
	03/04/13		11.26	780.86
	04/29/13		10.37	781.75
MW49(200)	04/05/10	792.26	32.64	759.62
	08/02/10		33.03	759.23
	12/06/10		33.71	758.55
	03/21/11		32.91	759.35
	09/19/11		33.68	758.58
	04/09/12		32.47	759.79
	12/17/12		34.34	757.92
	03/04/13		34.61	757.65
	04/29/13		32.16	760.10

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation(1)	Depth to Water (ftbtoc)(2)	Ground Water Elevation
MW50(45)	04/05/10	770.58	6.71	763.87
	08/02/10		7.01	763.57
	12/06/10		8.11	762.47
	03/21/11		7.14	763.44
	09/19/11		7.68	762.90
	04/09/12		6.65	763.93
	12/17/12		9.04	761.54
	04/29/13		6.31	764.27
MW50(80)	04/05/10	770.61	7.72	762.89
	08/02/10		8.04	762.57
	12/06/10		9.06	761.55
	03/21/11		8.12	762.49
	09/19/11		8.69	761.92
	04/09/12		7.65	762.96
	12/17/12		9.94	760.67
	04/29/13		7.31	763.30
MW50(130)	04/05/10	770.56	10.30	760.26
	08/02/10		11.02	759.54
	12/06/10		11.53	759.03
	03/21/11		10.47	760.09
	09/19/11		11.33	759.23
	04/09/12		9.71	760.85
	12/17/12		11.85	758.71
	04/29/13		9.13	761.43
MW51(25)	04/05/10	757.19	3.53	753.66
	08/02/10		3.89	753.30
	12/06/10		4.26	752.93
	03/21/11		3.56	753.63
	09/19/11		4.31	752.88
	04/09/12		3.00	754.19
	12/17/12		4.72	752.47
	4/29/2013(4)	756.74	2.14	754.60
MW51(70)	04/05/10	757.18	3.53	753.65
	08/02/10		3.89	753.29
	12/06/10		4.27	752.91
	03/21/11		3.58	753.60
	09/19/11		4.32	752.86
	04/09/12		3.63	753.55
	12/17/12		4.75	752.43
	4/29/2013(4)	756.74	2.18	754.56
MW51(117)	04/05/10	757.19	4.48	752.71
	08/02/10		5.01	752.18
	12/06/10		5.58	751.61
	03/21/11		4.54	752.65
	09/19/11		5.72	751.47
	04/09/12		4.58	752.61
	12/17/12		6.16	751.03
	4/29/2013(4)	756.75	2.81	753.94

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW52(55)	04/05/10	798.84	13.26	785.58
	08/02/10		13.11	785.73
	12/06/10		14.22	784.62
	03/21/11		14.40	784.44
	09/19/11		13.82	785.02
	04/09/12		12.75	786.09
	12/17/12		15.09	783.75
	03/04/13		15.35	783.49
	04/29/13		14.68	784.16
MW52(148)	04/05/10	798.81	14.51	784.30
	08/02/10		14.36	784.45
	12/06/10		15.54	783.27
	03/21/11		15.65	783.16
	09/19/11		15.07	783.74
	04/09/12		14.05	784.76
	12/17/12		16.37	782.44
	03/04/13		16.62	782.19
	04/29/13		15.86	782.95
MW53(41)	04/05/10	809.87	24.15	785.72
	08/02/10		24.15	785.72
	12/06/10		25.26	784.61
	03/21/11		25.07	784.80
	09/19/11		24.74	785.13
	04/09/12		23.82	786.05
	12/17/12		26.21	783.66
	03/04/13		26.11	783.76
	04/29/13		24.94	784.93
MW55(49)	04/05/10	799.24	12.41	786.83
	08/02/10		12.27	786.97
	12/06/10		13.46	785.78
	03/21/11		13.25	785.99
	09/19/11		13.07	786.17
	04/09/12		11.91	787.33
	12/17/12		14.57	784.67
	03/04/13		14.34	784.90
	04/29/13		12.87	786.37
MW56(50)	04/05/10	797.23	10.67	786.56
	08/02/10		10.56	786.67
	12/06/10		11.88	785.35
	03/21/11		11.50	785.73
	09/19/11		11.28	785.95
	04/09/12		10.14	787.09
	12/17/12		12.71	784.52
	03/04/13		12.55	784.68
	04/29/13		11.14	786.09
MW57(38)	04/05/10	795.51	7.59	787.92
	08/02/10		7.41	788.10
	12/06/10		6.01	789.50
	03/21/11		8.51	787.00
	09/19/11		8.54	786.97
	04/09/12		7.05	788.46
	12/17/12		9.99	785.52
	03/04/13		9.68	785.83
	04/29/13		7.91	787.60

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW59(29)	04/05/10	799.57	13.89	785.68
	08/02/10		13.81	785.76
	12/06/10		15.02	784.55
	03/21/11		14.75	784.82
	09/19/11		14.43	785.14
	04/09/12		13.54	786.03
	09/27/12		15.44	784.13
	12/17/12		15.88	783.69
	12/28/12		15.96	783.61
	01/07/13		16.00	783.57
	03/04/13		15.81	783.76
	04/29/13		14.68	784.89
MW59(46)	04/05/10	799.25	13.48	785.77
	08/02/10		13.39	785.86
	12/06/10		14.62	784.63
	03/21/11		14.35	784.90
	09/19/11		14.06	785.19
	04/09/12		13.14	786.11
	09/26/12		15.07	784.18
	12/17/12		15.53	783.72
	12/28/12		15.56	783.69
	01/07/13		15.64	783.61
	03/04/13		15.41	783.84
	04/29/13		14.23	785.02
MW60(38)	04/05/10	798.51	12.59	785.92
	08/02/10		12.51	786.00
	12/06/10		13.72	784.79
	03/21/11		13.45	785.06
	09/19/11		13.18	785.33
	04/09/12		12.20	786.31
	09/26/12	798.51	14.18	784.33
	12/17/12		14.91	783.60
	12/28/12		14.74	783.77
	01/07/13		14.71	783.80
	03/04/13		14.50	784.01
	04/29/13		13.29	785.22
MW61(26)	04/05/10	802.27	16.60	785.67
	08/02/10		16.49	785.78
	12/06/10		17.73	784.54
	03/21/11		17.46	784.81
	09/19/11		17.16	785.11
	04/09/12		16.24	786.03
	12/17/12		18.62	783.65
	03/04/13		18.52	783.75
	04/29/13		17.39	784.88
MW62(36)	04/05/10	810.71	25.25	785.46
	08/02/10		25.21	785.50
	12/06/10		26.34	784.37
	03/21/11		26.13	784.58
	09/19/11		25.82	784.89
	04/09/12		24.91	785.80
	12/17/12		27.26	783.45
	03/04/13		27.16	783.55
	04/29/13		26.02	784.69

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[(1)]	Depth to Water (ftbtoc)[(2)]	Ground Water Elevation
MW65(32)	04/05/10	809.40	23.87	785.53
	08/02/10		23.85	785.55
	12/06/10		24.98	784.42
	03/21/11		24.76	784.64
	09/19/11		24.48	784.92
	04/09/12		23.56	785.84
	12/17/12		25.91	783.49
	03/04/13		25.80	783.60
	04/29/13		24.70	784.70
MW67(30)	04/05/10	809.53	23.61	785.92
	08/02/10		23.81	785.72
	12/06/10		24.99	784.54
	03/21/11		24.78	784.75
	09/19/11		24.44	785.09
	04/09/12		23.67	785.86
	09/26/12	809.53	25.44	784.09
	12/17/12		25.84	783.69
	03/04/13		25.81	783.72
	04/29/13		24.75	784.78
MW68(32)	04/05/10	809.46	23.85	785.61
	08/02/10		23.76	785.70
	12/06/10		24.94	784.52
	03/21/11		24.71	784.75
	09/19/11		24.42	785.04
	04/09/12		23.50	785.96
	12/17/12		25.81	783.65
	03/04/13		25.72	783.74
	04/29/13		24.67	784.79
MW71(33)	04/05/10	809.15	23.55	785.60
	08/02/10		23.44	785.71
	12/06/10		24.61	784.54
	03/21/11		24.40	784.75
	09/19/11		24.06	785.09
	04/09/12		23.19	785.96
	12/17/12		25.48	783.67
	03/04/13		25.49	783.66
	04/29/13		24.35	784.80
MW72(32)	04/05/10	808.92	23.33	785.59
	08/02/10		23.24	785.68
	12/06/10		24.41	784.51
	03/21/11		24.21	784.71
	09/19/11		23.88	785.04
	04/09/12		22.99	785.93
	12/17/12		25.38	783.54
	03/04/13		25.22	783.70
	04/29/13		24.15	784.77
MW75(32)	04/05/10	809.39	23.93	785.46
	08/02/10		23.86	785.53
	12/06/10		25.02	784.37
	03/21/11		24.91	784.48
	09/19/11		24.49	784.90
	04/09/12		23.58	785.81
	12/17/12		25.91	783.48
	03/04/13		26.81	782.58
	04/29/13		24.73	784.66

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW76(30)	12/17/12	809.28	25.41	783.87
	03/04/13		25.54	783.74
	04/29/13		24.49	784.79
MW77(41)	12/17/12	809.39	25.88	783.51
	03/04/13		25.78	783.61
	04/29/13		24.69	784.70
MW78(35)	12/17/12	809.30	25.91	783.39
	03/04/13		25.71	783.59
	04/29/13		24.64	784.66
MW79(30)	12/17/12	809.26	25.78	783.48
	03/04/13		25.68	783.58
	04/29/13		24.58	784.68
MW80(19)	12/17/12	792.99	5.58	787.41
	03/04/13		8.24	784.75
	04/29/13		6.81	786.18
MW81(27)	11/05/12	798.34	14.21	784.13
	12/17/12		14.58	783.76
	12/27/12		14.64	783.70
	01/07/13		14.58	783.76
	03/04/13		14.24	784.10
	04/29/13		12.99	785.35
MW81(45)	12/17/12	797.68	13.97	783.71
	12/27/12		14.01	783.67
	01/07/13		14.09	783.59
	03/04/13		13.86	783.82
	04/29/13		12.72	784.96
MW82(58)	12/17/12	807.38	23.99	783.39
	03/04/13		23.86	783.52
	04/29/13		22.79	784.59
MW83(64)	12/17/12	807.67	24.28	783.39
	03/04/13		24.30	783.37
	04/29/13		23.12	784.55
MW84(44)	12/17/12	824.91	41.74	783.17
	03/04/13		41.64	783.27
	04/29/13		40.61	784.30
MW84(65)	12/17/12	824.56	41.61	782.95
	03/04/13		41.52	783.04
	04/29/13		40.49	784.07
MW85(39)	12/17/12	796.49	23.93	772.56
	03/04/13		13.28	783.21
	04/29/13		12.22	784.27
MW85(70)	12/17/12	796.44	13.55	782.89
	03/04/13		13.48	782.96
	04/29/13		12.44	784.00
MW85(130)	12/17/12	796.46	13.13	783.33
	03/04/13		13.08	783.38
	04/29/13		12.01	784.45

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
MW89(28)	12/17/12	797.77	14.06	783.71
	03/04/13		13.96	783.81
	04/29/13		12.79	784.98
INJ-1	11/28/12	795.55	10.91	784.64
	12/17/12		11.06	784.49
	03/04/13		10.78	784.77
INJ-2	12/17/12	798.42	14.52	783.90
	03/04/13		14.31	784.11
INJ-3	12/17/12	798.61	14.88	783.73
	03/04/13		14.68	783.93
OW-3E	12/17/12	800.56	16.66	783.90
OW-3N	12/17/12	800.26	16.32	783.94
OW-6N	12/17/12	800.05	16.11	783.94
OW-6W	12/17/12	800.29	16.34	783.95
	03/04/13		16.22	784.07
	04/29/13		15.00	785.29
OW-10E	12/17/12	800.66	16.77	783.89
OW-15E	12/17/12	800.87	16.99	783.88
OW-15N	12/17/12	799.49	15.57	783.92
OW-25E	12/17/12	801.12	17.25	783.87
OW-25N	12/17/12	798.83	14.91	783.92
OW-33E	12/17/12	801.45	17.63	783.82
PM1	11/05/12	798.06	13.71	784.35
	12/28/12		13.92	784.14
	01/07/13		14.25	783.81
	03/04/13		13.74	784.32
	04/29/13		12.48	785.58
PM2	11/05/12	798.45	14.32	784.13
	12/27/12		14.56	783.89
	01/07/13		14.85	783.60
	03/04/13		14.32	784.13
	04/29/13		14.09	784.36
PM3	11/05/12	808.40	24.70	783.70
	12/28/12		24.76	783.64
	01/07/13		24.85	783.55
	03/04/13		24.63	783.77
	04/29/13		23.58	784.82
TIW	12/17/12	800.47	16.52	783.95
ZVI-1(16.5)	12/17/12	790.28	9.77	780.51
	01/08/13		9.90	780.38
	03/04/13		9.55	780.73
	04/03/13		9.85	780.43
	04/29/13		8.61	781.67

Table 3-1
Surveyed Elevation Data and Depth to Water for Monitoring Wells and Staff Gages
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well/Point ID	Date Measured	Top of Casing Elevation[1]	Depth to Water (ftbtoc)[2]	Ground Water Elevation
ZVI-1(34.5)	12/17/12	790.26	9.63	780.63
	01/08/13		9.76	780.50
	03/04/13		9.41	780.85
	04/03/13		9.36	780.90
	04/29/13		8.46	781.80
ZVI-2(17.5)	12/17/12	791.17	10.66	780.51
	01/08/13		10.77	780.40
	03/04/13		10.42	780.75
	04/03/13		10.39	780.78
	04/29/13		9.49	781.68
ZVI-2(32.5)	12/17/12	791.19	10.58	780.61
	01/08/13		32.50	758.69
	03/04/13		10.36	780.83
	04/03/13		10.28	780.91
	04/29/13		9.40	781.79
SG-1	04/05/10	781.79	0.98	779.77
	08/02/10		0.98	779.77
	12/06/10		0.50	779.29
	03/21/11		0.42	779.21
	09/19/11		0.78	779.57
	04/09/12		NM	NM
	12/17/12		NM	NM
	04/29/13		0.08	778.87
SG-2	04/05/10	785.73	1.20	783.93
	08/02/10		0.85	783.58
	12/06/10		0.80	783.53
	03/21/11		0.78	783.51
	09/19/11		0.86	783.59
	04/09/12		NM	NM
	12/17/12		NM	NM
	04/29/13		0.78	783.51
SG-3	04/05/10	793.42	0.69	791.11
	08/02/10		1.21	791.63
	12/06/10		0.12	790.54
	03/21/11		0.28	790.70
	09/19/11		0.10	790.52
	04/09/12		NM	NM
	12/17/12		0.73	791.15
	03/04/13		-0.05	790.37
	04/29/13		0.70	791.12
RG-1	04/05/10	764.29	20.35	743.94
	08/02/10		21.60	742.69
	12/06/10		21.51	742.78
	03/21/11		19.50	744.79
	09/19/11		19.41	744.88
	04/09/12		21.22	743.07
	12/17/12		NM	NM
	04/29/13		17.73	746.56

MW- Monitoring well
NM - Not measured
SG - Staff Gage
ftbtoc - feet below top of casing
RG - Rail Gage. Located on west side of bridge over Tippecanoe River.

[1] ATOC - (Above Top of Casing), Casing was extended on May 13, 2009.

[2] Reference Elevation on SG-1, SG-2, and SG-3 is 3.00 feet mark on Staff Gage

[3] For Staff Gages (SG-1, SG-2, and SG-3), Depth to Water measurement is observed level of water surface in contact w/ graduated markings on the staff gage

[4] MW-51 well casings were reduced at surface on December 17, 2012 and resurveyed on December 20, 2012

Prepared by: RED
Checked by: RLB

Table 3-2

Groundwater Gradients and Velocity Along Inferred Plume Centerline
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Locations			Distance Between Well Locations (feet)	Elevation Change Between Wells (feet)	Groundwater Gradient (foot/foot)	Effective Porosity	Hydraulic Conductivity (cm/s)	Hydraulic Conductivity (ft/day)	Groundwater Velocity (ft/day)	Groundwater Velocity (ft/yr)
PM- 1		MW- 67(30)	122	0.80	**0.0066**	0.26	1.63E-02	46.2	**1.17**	**425.2**
MW- 67(30)	to	MW- 78	76	0.120	**0.0016**	0.26	1.63E-02	46.2	**0.28**	**102.4**
MW- 78	to	MW- 12	144	0.06	**0.0004**	0.26	1.63E-02	46.2	**0.07**	**27.0**
MW- 12	to	MW- 15	390	1.06	**0.0027**	0.26	1.63E-02	46.2	**0.48**	**176.3**
MW- 15	to	MW- 17	324	2.26	**0.0070**	0.26	1.63E-02	46.2	**1.24**	**452.3**
MW- 17	to	MW- 30(41.1)	837	6.62	**0.0079**	0.26	1.63E-02	46.2	**1.41**	**512.9**
				Average:	**0.0044**	**0.26**	**1.63E-02**	**46.2**	**0.77**	**282.7**

Notes:
Groundwater elevations calculated from depth to water measurements obtained on April 30, 2013.
GW Velocity calculated by V = iK/ne
i= gradient
K = hydraulic conductivitiy
ne= effective porosity

Prepared by: RJC
Checked by: PJS

Table 5-1

Summary of Volatile Organic Compound Analyses Performed on Soil Samples Collected from Soil Borings Installed October 2012
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per kilogram, µg/kg*)

Boring Number	Field Sample ID	Sample Date	Sample collected below groundwater surface	Oily Residue Present	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
B76	ATR-B76-S(33-34)101713	10/17/12	Yes	No	37 U	**9,100**	370 U	**70**	37 U	**5,000** U
B77	ATR-B77-S(31-32)101812	10/18/12	Yes	Yes	**5.2**	**585**	300 U	**7.3**	30.0 U	**135**
B78	ATR-B78-S(32-34)101612	10/16/12	Yes	No	7.8 U	**347**	78 U	7.8 U	7.8 U	7.8 U
	ATR-B78-S(34-36)101612	10/16/12	Yes	No	4.1 U	**6.22**	39 U	4.1 U	4.1 U	4.1 U
B79	ATR-B79-S(26-28)101912	10/19/12	Yes	No	36 U	**5,300**	360 U	36 U	36 U	**2,700** U
B81	ATR-B81-S(10-12)101512	10/15/12	No	Yes	4.1 U	4.1 U	41 U	4.1 U	4.1 U	4.1 U
	ATR-B81-S(12-14)101512	10/15/12	No	Yes	4.05 U	4.05 U	40.3 U	4.05 U	4.05 U	4.05 U
B89	ATR-B89-S(12-14)102112	12/21/12	No	No	15 U	15 U	150 U	15 U	15 U	15 U
	ATR-B89-S(23-24)102112	12/21/12	Yes	No	13 U	13 U	130 U	13 U	13 U	13 U

Notes:
NA - Not analyzed
* = Results reported in micrograms per kilogram using AMECs Mobile GC and vapor headspace analyses
R - replicate sample
FL - Fixed Lab (ALS Laboratory)
U - not detected, value is the detection limit
J - value is estimated

Prepared by: WDG
Checked by: PJS

Table 5-2

Summary of Volatile Organic Compound Analyses Performed on Groundwater Samples Collected from Soil Borings Installed between October and November 2012 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Boring Number	Field Sample ID	Sample Date	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
B76	ATR-B76-G(37-40)101713	10/17/12	2 U	**1,300**	20 U	**7.45**	20 U	**1,500**
	ATR-B76-G(37-40)101713-FL	10/17/12	5 U	**1,000**	10 U	5 U	5 U	**600**
B77	ATR-B77-G(29-39)101812	10/18/12	**1,700**	**255,000 J**	2,000 U	2,000 U	2,000 U	**46,000**
	ATR-B77-G(39-40)101812	10/18/12	**5.2**	**585**	20 U	**7.3**	20 U	**135**
	ATR-B77-G(39-40)101812-FL	10/18/12	1 U	**770**	1 U	**5**	1 U	**71**
B79	ATR-B79-G(39-40)101912	10/19/12	2 U	**230**	20 U	2 U	20 U	**47**
	ATR-B79-G(39-40)101912-FL	10/19/12	1 U	**170**	2 U	1 U	**2.9**	**24**
B81	ATR-B81-G(13-18)101512	10/15/12	2 U	**53**	20 U	2 U	20 U	**91**
MW-81(27)	MW-81(27)*	10/17/12	**355**	**18,500**	200 U	200 U	**9,200**	**3,300**
B81B	ATR-B81-G(30-35)102112	10/21/12	**66**	**2,000**	200 U	**33**	**960**	**260**
	ATR-B81-G(30-35)102112-FL	10/21/12	**73**	**4,800**	2 U	**42**	**1,500**	**540**
B81C	ATR-B81C-G(24-29)120312	12/03/12	**14**	**2,100**	200 U	10 U	**105**	**1,160**
	ATR-B81C-G(34-39)120312	12/03/12	**100**	**6,200**	200 U	**55** U	**2,100**	**1,035**
	ATR-B81C-G(34-39)120312-FL	12/03/12	**51**	**5,100**	20 U	**27** U	**2,300**	**480**
	ATR-B81C-G(40-45)120312	12/03/12	200 U	**710**	2,000 U	200 U	**340**	**277**
B82	ATR-B82-G(23-28)102912	10/29/12	200 U	**13,180**	2,000 U	200 U	200 U	**1,470**
	ATR-B82-G(33-38)102912	10/29/12	200 U	**4,903**	2,000 U	200 U	200 U	**5,480**
	ATR-B82-G(33-38)102912-FL	10/29/12	**6.4**	**1,900**	10 U	**7.5**	5 U	**1,100**
	ATR-B82-G(43-48)102912	10/29/12	200 U	**4,879**	2,000 U	200 U	200 U	**2,984**
	ATR-B82-G(43-48)102912-FL	10/29/12	5 U	**1,900**	10 U	**8.6**	5 U	**640**
	ATR-B82-G(53-58)102912	10/29/12	20 U	**568**	200 U	20 U	27 U	**590**
	ATR-B82-G(53-58)102912-FL	10/29/12	**1.1**	**470**	2 U	**2.8**	**7.3**	**140**
B83	ATR-B83-G(35-40)103112	10/31/12	20 U	**9 J**	200 U	20 U	20 U	**85**
	ATR-B83-G(35-40)R103112	10/31/12	20 U	**8.2 J**	200 U	20 U	20 U	**74**
	ATR-B83-G(35-40)103112-FL	10/31/12	1 U	**6.6**	2 U	1 U	1 U	**23**
	ATR-B83-G(35-40)103112R-FL	10/31/12	1 U	**6.4**	2 U	1 U	1 U	**23**
	ATR-B83-G(49-54)110112	11/01/12	2 U	**1.7 J**	20 U	2 U	2 U	2 U
	ATR-B83-G(49-54)110112-FL	11/01/12	1 U	**1.4**	2 U	1 U	1 U	1 U
	ATR-B83-G(59-64)110112	11/01/12	2 U	2 U	20 U	2 U	2 U	2 U
	ATR-B83-G(59-64)110112-FL	11/01/12	1 U	1 U	2 U	1 U	1 U	1 U

Table 5-2

Summary of Volatile Organic Compound Analyses Performed on Groundwater Samples Collected from Soil Borings Installed between October and November 2012 TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

(Results reported in micrograms per liter, µg/L)

Boring Number	Field Sample ID	Sample Date	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
B84	ATR-B84-G(39-44)110212	11/02/12	2 U	2 U	20 U	2 U	**11.9**	2 U
	ATR-B84-G(39-44)110212-FL	11/02/12	1 U	1 U	2 U	1 U	**8.6**	1 U
	ATR-B84-G(50-65)110212	11/02/12	2 U	**7.8**	20 U	2 U	**12.8**	**4.9**
	ATR-B84-G(50-65)110212-FL	11/02/12	1 U	**14**	2 U	1 U	**9.5**	**3.4**
	ATR-B84-G(60-75)110212	11/02/12	2 U	2 U	20 U	2 U	2 U	2 U
	ATR-B84-G(70-75)110312	11/03/12	2 U	2 U	20 U	2 U	2 U	2 U
	ATR-B84-G(70-75)110312-FL	11/03/12	1 U	1 U	2 U	1 U	1 U	1 U
B85	ATR-B85-G(44-49)112812	11/28/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(44-49)112812R	11/28/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(44-49)112812-FL	11/28/12	1 U	1 U	2 U	1 U	1 U	1 U
	ATR-B85-G(54-59)112812	11/28/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(54-59)112812-FL	11/28/12	1 U	1 U	2 U	1 U	1 U	1 U
	ATR-B85-G(64-69)112812	11/28/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(94-99)112812	11/28/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(94-99)112812-FL	11/28/12	1 U	1 U	2 U	1 U	1 U	1 U
	ATR-B85-G(114-119)112912	11/29/12	1 U	1 U	10 U	1 U	1 U	2 U
	ATR-B85-G(114-119)112912-FL	11/29/12	1 U	1 U	2 U	1 U	1 U	1 U
	ATR-B85-G(124-129)112912	11/29/12	1 U	1 U	10 U	1 U	1 U	2 U
INJ-1*	ATR-INJ1-G102912	10/29/12	**553**	**181,149 J**	200 U	**838**	**80,914 J**	**16,000**
INJ-2*	ATR-INJ2-G110212	11/02/12	**257**	**42,323 J**	200 U	**309**	**2,934**	**22,000 J**
INJ-3*	ATR-INJ3-G110212	11/02/12	200 U	**21,531 J**	200 U	200 U	**4,644**	**16,432**

Notes:
NA - Not analyzed
U - not detected, value is the detection limit
J - value is estimated
* = Sample was collected from well casing after well installation

Prepared by: WDG
Checked by: PJS

Table 6-1
Summary of Geochemical Parameters, Competing Electron Acceptors, and Chlorinated Hydrocarbon Degrading Bacteria Analyses for Performance Groundwater Monitoring
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Method	Analyte	Laboratory	MDL	PQL	Unit
Geochemistry Parameters					
SW9060	Total Organic Carbon	ALS	0.021	0.50	mg/L
A2320 B	Alkalinity (as $CaCO_3$)	ALS	1.68	12.0	mg/L
SW6020A	Iron	ALS	0.00005	0.005	mg/L
SW6020A	Manganese	ALS	0.00005	0.005	mg/L
SW9056	Nitrate	ALS	0.006	0.020	mg/L
SW9056	Sulfate	ALS	0.245	1.0	mg/L
SW9056	Chloride	ALS	0.065	1.0	mg/L
SW9030	Sulfide	ALS	0.776	1.0	mg/L
Volatile Fatty Acids					
IC by SOP AM23G	Acetic Acid	Microseeps[a]	N/A	0.07	mg/L
IC by SOP AM23G	Butyric Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Lactic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	n-Pentanoic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	i-Pentanoic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Propionic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Pyruvic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	n-Hexanoic Acid	Microseeps	N/A	0.10	mg/L
IC by SOP AM23G	i-Hexanoic Acid	Microseeps	N/A	0.10	mg/L
Dissolved Gases					
AM20GAX	Methane	Microseeps	N/A	0.100	µg/L
AM20GAX	Ethane	Microseeps	N/A	0.025	µg/L
AM20GAX	Ethene	Microseeps	N/A	0.025	µg/L
Dehalococcoides (DHC)					
qPCR	Total DHC	Microbrial Insights	N/A	500	c/s
qPCR	TCE Reductase (tceA)	Microbrial Insights	N/A	500	c/s
qPCR	Vinyl Chloride Reductase (bvcA)	Microbrial Insights	N/A	500	c/s
qPCR	Vinyl Chloride Reductase (vcrA)	Microbrial Insights	N/A	500	c/s

Notes:
qPCR - quantitative polymerase chain reaction
MDL - method detection Limit
PQL - practical quantitation Limit
c/s - counts per sample
µg/L - micrograms per Liter
mg/L - miligrams per Liter
IC - ion chromatogaphy
N/A - Not applicable
[a] - Microseeps is now Pace Analytical Energy Services

Prepared by: RJC
Checked by: PJS

Table 6-2

Summary of Measured Field Parameters and Total Organic Carbon
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

		Field Measured Parameters							TOC
		pH	Conductivity	Temperature	Turbidity	DO	ORP	Ferrous Iron	TOC
Sample ID	Sample Date	S.U.	mS/cm	°C	NTU	mg/L	mV	mg/L	mg/L
Source Area Pilot Test									
ATR-MW59(29)-G092712	9/27/2012	**6.86**	**0.417**	**14.92**	**0.9**	**0.35**	**-81.6**	**2.5**	**10**
ATR-MW59(29)-G122812	12/28/2012	**5.56**	**1.178**	**14.15**	**5.0**	**0.25**	**-59.0**	NM	NA
ATR-MW59(29)-G010713	1/7/2013	**5.28**	**1.864**	**14.31**	**6.1**	**0.41**	**55.7**	**5.0**	**1,300**
ATR-MW59(29)-G020413	2/4/2013	**6.81**	**1.012**	**13.84**	**4.5**	**0.55**	**-132.3**	**2.0**	**430**
ATR-MW59(29)-G030613	3/6/2013	**6.12**	**0.802**	**13.64**	**14.4**	**0.13**	**-75.8**	**3.0**	**200**
ATR-MW59(29)-G050313	5/3/2013	**6.61**	**0.476**	**14.09**	**9.0**	**0.17**	**-105.4**	NM	**17**
ATR-MW59(46)-G092612	9/26/2012	**7.37**	**0.312**	**14.41**	**0.0**	**0.37**	**-144.4**	**1.9**	**8.0**
ATR-MW59(46)-G092612R	9/26/2012	NA	NA	NA	NA	NA	NA	NA	**8.4**
ATR-MW59(46)	12/18/2012	**7.53**	**0.286**	**13.34**	**1.1**	**0.21**	**-181.5**	**3.0**	NA
ATR-MW59(46)	12/28/2012	**7.33**	**0.277**	**12.31**	**1.7**	**0.18**	**-162.5**	NM	NA
ATR-MW59(46)	2/5/2013	**7.40**	**0.303**	**13.00**	NM	**0.23**	**-193.4**	NM	NA
ATR-MW59(46)-G030513	3/5/2013	**7.41**	**0.282**	**13.21**	**0.0**	**0.11**	**-164.5**	NM	**7.7**
ATR-MW59(46)-G030513	3/5/2013	**7.55**	**0.286**	**14.07**	**3.3**	**0.19**	**-157.5**	**2.0**	**7.8**
ATR-MW60(38)-G092612	9/26/2012	**7.36**	**0.320**	**13.98**	**0.0**	**0.44**	**-148.2**	**1.5**	**8.3**
ATR-MW60(38)	12/28/2012	**7.55**	**0.200**	**12.29**	**1.1**	**0.18**	**-142.4**	NM	NA
ATR-MW60(38)	1/7/2013	**7.65**	**0.250**	**13.41**	**8.1**	**0.25**	**-163.2**	NM	NA
ATR-MW60(38)	2/4/2013	**7.59**	**0.303**	**13.15**	**0.0**	**0.33**	**-175.7**	NM	NA
ATR-MW60(38)-G030513	3/5/2013	**7.55**	**0.271**	**13.70**	**0.0**	**0.09**	**-161.8**	NM	**7.5**
ATR-MW60(38)-G050213	5/2/2013	**7.65**	**0.271**	**13.98**	**3.0**	**0.19**	**-160.2**	NM	**7.8**
ATR-PM1-G110512	11/5/2012	**6.99**	**0.688**	**15.93**	**5.2**	**0.16**	**-79.4**	NM	**12**
ATR-PM1	12/28/2012	**6.91**	**0.465**	**12.95**	**1.1**	**0.21**	**-91.8**	NM	NA
ATR-PM1-G010713	1/7/2013	**7.01**	**0.435**	**14.50**	**5.4**	**0.75**	**-90.4**	**3.0**	**11**
ATR-PM1-G020413	2/4/2013	**7.81**	**0.510**	**13.32**	**10.6**	**1.76**	**-155.9**	**3.5**	**11**
ATR-PM1-G030613	3/6/2013	**6.95**	**0.514**	**12.70**	**50.1**	**0.14**	**-122.2**	**2.5**	**11**
ATR-PM1-G030613R	3/6/2013	NA	NA	NA	NA	NA	NA	NA	**11**
ATR-PM1-G050313	5/3/2013	**6.99**	**0.480**	**12.61**	**1.4**	**0.19**	**-137.7**	NM	**12**
ATR-PM1-G050313R	5/3/2013	NA	NA	NA	NA	NA	NA	NA	**12**

Table 6-2

Summary of Measured Field Parameters and Total Organic Carbon
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

		Field Measured Parameters							TOC
		pH	Conductivity	Temperature	Turbidity	DO	ORP	Ferrous Iron	TOC
Sample ID	Sample Date	S.U.	mS/cm	°C	NTU	mg/L	mV	mg/L	mg/L
ATR-PM2-G110512	11/5/2012	6.98	0.617	15.69	5.4	0.61	-49.8	NM	9.7
ATR-PM2	12/27/2012	6.56	0.519	13.20	50.8	0.40	34.5	NM	NA
ATR-PM2-G010713	1/7/2013	6.64	0.571	13.70	4.3	0.41	0.8	3.5	9.8
ATR-PM2-G020413	2/4/2013	6.86	0.518	14.02	7.0	0.27	-133.9	4.0	9.9
ATR-PM2-G030613	3/6/2013	6.78	0.530	13.15	4.8	0.12	-118.9	4.0	10
ATR-PM2-G050313	5/3/2013	6.80	0.512	12.87	8.6	0.11	-125.5	NM	16
ATR-PM3-G110512	11/5/2012	6.51	0.645	13.98	8.6	0.06	-31.8	NM	14
ATR-PM3	12/28/2012	6.55	0.461	12.12	1.8	0.29	-37.6	NM	NA
ATR-PM3-G010713	1/7/2013	6.47	0.573	12.07	4.6	0.41	35.7	2.0	15
ATR-PM3-G020413	2/4/2013	6.59	0.494	13.70	9.8	0.22	-92.9	2.0	14
ATR-PM3-G030513	3/5/2013	6.45	0.468	12.99	5.4	0.11	-83.7	1.5	14
ATR-PM3-G050213	05/02/2013	6.61	0.499	14.60	6.0	0.21	-62.1	NM	15
ATR-MW72(32)-G030613	3/6/2013	6.98	0.600	16.20	753.8	2.83	-56.1	NM	NA
ATR-MW72(32)-G050613	5/6/2013	6.99	0.570	16.95	721.0	3.04	-93.9	NM	NA
ATR-MW81(27)-G110512	11/5/2012	6.82	0.486	15.32	5.3	0.09	-65.6	NM	9.7
ATR-MW81(27)	12/27/2012	6.57	0.495	14.35	0.0	0.34	152.4	NM	NA
ATR-MW81(27)-G010713	1/7/2013	6.65	0.488	14.51	8.3	0.22	-55.8	2.8	190
ATR-MW81(27)-G020513	2/5/2013	7.08	0.448	14.13	8.7	0.34	-153.2	2.5	26
ATR-MW81(27)-G030613	3/6/2013	6.72	0.416	13.26	1.2	0.14	-75.1	2.5	12
ATR-MW81(27)-G050313	5/3/2013	6.78	0.419	13.64	4.8	NM	-81.1	NM	11
ATR-MW81(45)-G120512	12/5/2012	7.47	0.362	12.25	152.3	0.45	-9.6	NM	NA
ATR-MW81(45)-G120512R	12/5/2012	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)	12/27/2012	7.13	0.351	12.50	1.7	0.45	18.6	NM	NA
ATR-MW81(45)	1/7/2013	7.59	0.272	13.08	10.0	0.20	-146.9	NM	NA
ATR-MW81(45)	2/5/2013	7.66	0.300	12.52	3.1	0.77	-147.3	NM	NA
ATR-MW81(45)-G030513	3/5/2013	7.41	0.299	13.02	0.0	0.12	-162.1	NM	NA
ATR-MW81(45)-G050313	5/3/2013	7.53	0.301	13.88	3.0	0.19	-152.3	2.0	8.5

Table 6-2

Summary of Measured Field Parameters and Total Organic Carbon
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

		Field Measured Parameters							TOC
		pH	Conductivity	Temperature	Turbidity	DO	ORP	Ferrous Iron	TOC
Sample ID	Sample Date	S.U.	mS/cm	°C	NTU	mg/L	mV	mg/L	mg/L
ATR-INJ1-G112812	11/28/2012	**8.02**	**0.470**	**13.76**	**1325.0**	**3.14**	**46.6**	NM	NA
ATR-INJ1-G030513	3/5/2013	**5.29**	**1.643**	**10.38**	**463.0**	**2.89**	**-51.5**	NM	**1,200**
ATR-INJ2-G030613	3/6/2013	**5.03**	**2.116**	**12.86**	**97.0**	**1.05**	**-22.2**	NM	**3,900**
ATR-INJ3-G030513	3/5/2013	**4.79**	**1.503**	**13.01**	**370.0**	**2.64**	**19.6**	NM	**2,200**
Down-Gradient Product ABC+ Pilot Test									
ATR-MW16-G092612	09/26/2012	**7.23**	**0.383**	**13.31**	**0.0**	**0.24**	**-21.7**	**0.1**	**1.7**
ATR-MW16-G030613	3/6/2013	**6.76**	**0.870**	**13.16**	**0.0**	**0.11**	**-113.3**	NM	NA
ATR-MW16-G030613R	3/6/2013	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW16-G040313	4/3/2013	**6.12**	**0.992**	**13.09**	**0.0**	**0.20**	**-126.5**	NM	**43**
ATR-MW16-G050213	5/2/2013	**6.90**	**0.927**	**13.24**	**1.0**	**0.18**	**-124.2**	**5.5**	NA
ATR-MW17-G092612	09/26/2012	**7.00**	**0.663**	**12.60**	**0.0**	**0.23**	**1.2**	**0.0**	**1.5**
ATR-MW17	12/18/2012	**7.12**	**0.563**	**11.94**	NM	**0.24**	**74.3**	**0.0**	NA
ATR-MW17-G030613	3/6/2013	**7.11**	**0.552**	**11.36**	**1.8**	**0.14**	**-69.8**	NM	NA
ATR-MW17-G030613R	3/6/2013	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW17-G040313	4/3/2013	**7.10**	**0.572**	**12.12**	**0.3**	**0.26**	**4.7**	NM	**3.4**
ATR-MW17-G050213	5/2/2013	**7.16**	**0.563**	**12.67**	**2.9**	**0.19**	**-22.1**	**1.5**	NA
ATR-MW26(17.5)-G092712	09/27/2012	**7.18**	**0.427**	**14.78**	**0.0**	**0.28**	**-32.4**	**0.0**	**2.3**
ATR-MW26(17.5)-G010813	1/8/2013	**7.00**	**0.599**	**12.46**	**1.5**	**0.38**	**-34.8**	NM	**7.6**
ATR-MW26(17.5)	2/5/2013	**7.55**	**0.419**	**12.55**	**0.0**	**0.90**	**-118.0**	NM	NA
ATR-MW26(17.5)-G030613	3/6/2013	**7.33**	**0.407**	**12.42**	**0.0**	**0.18**	**-106.7**	NM	**2.8**
ATR-MW26(17.5)-G040313	4/3/2013	**6.07**	**0.406**	**12.39**	**0.0**	**0.16**	**-12.8**	NM	**2.7**
ATR-MW26(17.5)-G050313	5/3/2013	**7.28**	**0.408**	**12.54**	**4.7**	**0.22**	**-108.3**	**1.5**	NA

Table 6-2

Summary of Measured Field Parameters and Total Organic Carbon Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

		Field Measured Parameters							TOC
		pH	Conductivity	Temperature	Turbidity	DO	ORP	Ferrous Iron	TOC
Sample ID	Sample Date	S.U.	mS/cm	°C	NTU	mg/L	mV	mg/L	mg/L
ATR-MW26(28.8)-G092712	09/27/2012	**7.23**	**0.416**	**13.02**	**0.4**	**0.20**	**204.5**	NM	**1.1**
ATR-MW26(28.8)-G092712R	09/27/2012	NA	NA	NA	NA	NA	NA	NA	**1.1**
ATR-MW26(28.8)	12/18/2012	**6.70**	**0.900**	**13.40**	NM	**0.19**	**-96.2**	**6.5**	NA
ATR-MW26(28.8)-G010813	01/08/2013	**6.39**	**1.037**	**12.33**	**5.0**	**0.29**	**-71.4**	NM	**240**
ATR-MW26(28.8)	2/5/2013	**6.88**	**0.737**	**13.15**	NM	**0.25**	**-94.9**	NM	NA
ATR-MW26(28.8)-G030613	3/6/2013	**6.79**	**0.725**	**12.99**	**0.0**	**0.14**	**-82.1**	**4.0**	**150**
ATR-MW26(28.8)-G040313	4/3/2013	**6.77**	**0.741**	**13.05**	**0.0**	**0.13**	**-77.2**	NM	**140**
ATR-MW26(28.8)-G050313	5/3/2013	**6.98**	**0.581**	**13.19**	**0.0**	**0.22**	**-84.5**	**2.0**	NA
ATR-ZVI-1(16.5)-G121812	12/18/2012	**6.76**	**1.083**	**14.58**	**4.8**	**0.18**	**-106.4**	**6.0**	**510**
ATR-ZVI-1(16.5)-G010813	01/08/2013	**6.96**	**0.690**	**13.15**	**4.8**	**0.18**	**-133.5**	**7.0**	**200**
ATR-ZVI-1(16.5)-G030613	3/6/2013	**7.34**	**0.528**	**11.61**	**4.8**	**0.15**	**-158.5**	**5.5**	**68**
ATR-ZVI-1(16.5)-G040313	4/3/2013	**7.31**	**0.470**	**11.10**	**4.2**	**0.13**	**-151.0**	NM	**34**
ATR-ZVI-1(16.5)-G050313	5/3/2013	**7.49**	**0.464**	**11.60**	**4.6**	**0.20**	**-170.6**	**4.0**	NA
ATR-ZVI-1(34.5)-G121812	12/18/2012	**6.59**	**0.838**	**13.62**	**1.4**	**0.15**	**-83.1**	**5.0**	**440**
ATR-ZVI-1(34.5)-G010813	01/08/2013	**7.03**	**0.482**	**13.23**	**0.6**	**0.15**	**-88.1**	**0.5**	**95**
ATR-ZVI-1(34.5)-G030613	3/6/2013	**7.42**	**0.367**	**12.78**	**0.0**	**0.15**	**-112.3**	**0.5**	**1.8**
ATR-ZVI-1(34.5)-G040313	4/3/2013	**7.38**	**0.370**	**12.94**	**0.3**	**0.27**	**-116.4**	NM	**2.2**
ATR-ZVI-1(34.5)-G050313	5/3/2013	**7.39**	**0.367**	**13.03**	**0.0**	**0.19**	**-115.7**	**0.5**	NA
ATR-ZVI-2(17.5)-G121812	12/18/2012	**7.12**	**0.592**	**13.04**	**4.9**	**0.31**	**19.2**	**3.0**	**33**
ATR-ZVI-2(17.5)-G010813	01/08/2013	**7.14**	**0.440**	**12.96**	**4.8**	**0.24**	**-116.7**	**3.5**	**12**
ATR-ZVI-2(17.5)-G030613	3/6/2013	**7.35**	**0.404**	**11.91**	**4.1**	**0.21**	**-117.3**	**2.0**	**2.2**
ATR-ZVI-2(17.5)-G040313	4/3/2013	**7.28**	**0.422**	**11.85**	**3.4**	**0.21**	**-128.9**	NM	**2.1**
ATR-ZVI-2(17.5)-G050313	5/3/2013	**7.34**	**0.428**	**11.95**	**3.6**	**0.19**	**-134.2**	**3.0**	NA

Table 6-2

Summary of Measured Field Parameters and Total Organic Carbon
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

		Field Measured Parameters							TOC
		pH	Conductivity	Temperature	Turbidity	DO	ORP	Ferrous Iron	TOC
Sample ID	Sample Date	S.U.	mS/cm	°C	NTU	mg/L	mV	mg/L	mg/L
ATR-ZVI-2(32.5)-G121812	12/18/2012	6.80	0.887	13.13	3.8	0.29	26.1	3.0	270
ATR-ZVI-2(32.5)-G010813	01/08/2013	6.88	0.535	13.43	2.7	0.20	-75.9	3.1	87
ATR-ZVI-2(32.5)-G030613	3/6/2013	7.18	0.426	12.91	4.3	0.13	-109.5	2.5	26
ATR-ZVI-2(32.5)-G030613R	3/6/2013	NA	NA	NA	NA	NA	NA	NA	26
ATR-ZVI-2(32.5)-G040313	4/3/2013	6.90	0.427	13.11	0.4	0.21	-93.8	NM	20
ATR-ZVI-2(32.5)-G040313R	4/3/2013	NA	NA	NA	NA	NA	NA	NA	23
ATR-ZVI-2(32.5)-G050313	5/3/2013	7.23	0.508	13.10	0.5	0.19	-125.6	2.5	NA
Other Proposed Treatment Areas									
ATR-MW13-G092712	9/27/2012	7.26	0.382	14.80	337.4	1.70	-13.4	0.2	5.5
ATR-MW13	2/5/2013	7.49	0.396	12.36	NM	2.07	-16.1	NM	NA
ATR-MW13-G050613	5/6/2013	7.25	0.397	13.91	344.1	3.24	-13.2	NM	NA
ATR-MW14-G092712	9/27/2012	7.07	0.407	13.87	0.0	0.43	30.3	0.0	2.4
ATR-MW14	2/5/2013	7.50	0.390	12.86	67.0	0.92	-17.5	NM	NA
ATR-MW14-G030513	3/5/2013	7.22	0.393	12.95	0.0	0.17	13.0	NM	NA
ATR-MW14-G050213	5/2/2013	7.21	0.419	13.74	1.0	0.22	62.9	NM	NA
ATR-MW6C-G092612	09/26/2012	7.16	0.439	15.26	0.0	0.31	-26.0	0.3	4.2
ATR-MW6C-G030513	3/5/2013	7.11	0.446	15.03	0.0	0.22	-26.2	NM	NA
ATR-MW6C-G050713	5/7/2013	7.24	0.425	15.54	0.0	0.22	-62.0	NM	NA
ATR-MW6C-G050713R	5/7/2013	NA	NA	NA	NA	NA	NA	NM	NA
ATR-MW67(30)-G092612	09/26/2012	7.04	0.784	16.95	1341	3.04	164.7	1.0	8.2
ATR-MW67(30)-G050613	5/6/2013	7.03	0.633	NM	1242	4.01	78.5	NM	7.8

Notes:
NA - Not Analyzed/Not Applicable
NM - Not Measured
J - Estimated concentration, analyte detected below quantitation limit
U - Analyzed but not detected above the MDL
mS/cm - milli Siemen/centimeter
µg/L - micro grams per liter

TOC - Total Organic Carbon
NTU - Nephelometric Turbidity Units
mg/L - milligram per liter
mV - millivolt
°C - degrees Celcius
S.U. - Standard Unit
ORP - Oxidation-Reduction Potential

Prepared by: RJC
Checked by: PJS

Table 6-3

Summary of Target VOC Analytical and Molecular Concentrations
Performed on the Groundwater Samples Collected from the Pilot Test Performance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	VOCs												
		1,1-DCE (96.94)		cis-1,2-DCE (96.94)		trans-1,2-DCE (96.94)		PCE (165.83)		TCE (131.39)		Vinyl Chloride (62.50)		Total Molar Mass
		µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µmole
Source Area Pilot Test														
ATR-MW59(29)-G092712	9/27/12	**220**	*2.27*	**42,000**	*433*	**290**	*3.0*	100 U		50 U		**10,000**	*160*	***599***
ATR-MW59(29)-G010713	1/7/13	**150**	*1.55*	**31,000**	*320*	**190**	*2.0*	100 U		50 U		**13,000**	*208*	***531***
ATR-MW59(29)-G020413	2/4/13	**160**	*1.65*	**29,000**	*299*	**190**	*2.0*	10 U		5 U		**18,000**	*288*	***591***
ATR-MW59(29)-G030613	3/6/13	**69**	*0.71*	**18,000**	*186*	**140**	*1.4*	40 U		20 U		**23,000**	*368*	***556***
ATR-MW59(29)-G050313	5/3/13	100 U		**26,000**	*268*	100 U		200 U		100 U		**21,000**	*336*	***604***
ATR-MW59(46)-G092612	9/26/12	**33**	*0.34*	**4,400**	*45*	**26**	*0.3*	10 U		**650**	*4.9*	**260**	*4.2*	***55***
ATR-MW59(46)-G092612R	9/26/12	**32**	*0.33*	**4,000**	*41*	**25**	*0.3*	10 U		**570**	*4.3*	**260**	*4.2*	***50***
ATR-MW59(46)-G030513	3/5/13	**25**	*0.26*	**3,400**	*35*	**21**	*0.2*	10 U		**790**	*6.0*	**200**	*3.2*	***45***
ATR-MW59(46)-G030513	3/5/13	**20**	*0.21*	**2,900**	*30*	**18**	*0.2*	10 U		**700**	*5.3*	**140**	*2.2*	***38***
ATR-MW60(38)-G092612	9/26/12	1 U		**31**	*0.32*	1 U		2 U		1 U		**250**	*4.0*	***4.3***
ATR-MW60(38)-G030513	3/5/13	1 U		**33**	*0.34*	1 U		2 U		1 U		**140**	*2.2*	***2.6***
ATR-MW60(38)-G050213	5/2/13	1 U		**62**	*0.64*	1 U		2 U		1 U		**210**	*3.4*	***4.0***
ATR-PM1-G110512	11/5/12	**50**	*0.52*	**39,000**	*402*	**190**	*2.0*	100 U		**72**	*0.55*	**3,400**	*54*	***460***
ATR-PM1-G010713	1/7/13	50 U		**27,000**	*279*	**160**	*1.7*	100 U		50 U		**5,600**	*90*	***370***
ATR-PM1-G020413	2/4/13	**45**	*0.46*	**24,000**	*248*	**150**	*1.5*	100 U		50 U		**4,500**	*72*	***322***
ATR-PM1-G030613	3/6/13	**63**	*0.65*	**35,000**	*361*	**220**	*2.3*	100 U		50 U		**5,000**	*80*	***444***
ATR-PM1-G030613R	3/6/13	**67**	*0.69*	**34,000**	*351*	**230**	*2.4*	100 U		50 U		**4,600**	*74*	***427***
ATR-PM1-G050313	5/3/13	200 U		**49,000**	*505*	**200 U**		400 U		200 U		**4,600**	*74*	***579***
ATR-PM1-G050313R	5/3/13	200 U		**46,000**	*475*	**200 U**		400 U		200 U		**4,500**	*72*	***547***
ATR-PM2-G110512	11/5/12	**94**	*0.97*	**13,000**	*134*	**94**	*1.0*	40 U		**2,000**	*15*	**4,700**	*75*	***226***
ATR-PM2-G010713	1/7/13	**70**	*0.72*	**9,200**	*95*	**67**	*0.7*	20 U		**660**	*5.0*	**4,400**	*70*	***172***
ATR-PM2-G020413	2/4/13	**64**	*0.66*	**8,500**	*88*	**61**	*0.6*	40 U		**400**	*3.0*	**3,400**	*54*	***146***
ATR-PM2-G030613	3/6/13	**79**	*0.81*	**8,300**	*86*	**59**	*0.6*	20 U		**300**	*2.3*	**3,100**	*50*	***139***
ATR-PM2-G050313	5/3/13	**85**	*0.88*	**8,600**	*89*	**67**	*0.7*	40 U		**610**	*4.6*	**3,100**	*50*	***145***
ATR-PM3-G110512	11/5/12	**200**	*2.06*	**43,000**	*444*	**280**	*2.9*	100 U		**74**	*0.56*	**7,600**	*122*	***571***
ATR-PM3-G010713	1/7/13	**270**	*2.79*	**44,000**	*454*	**370**	*3.8*	100 U		50 U		**9,700**	*155*	***616***
ATR-PM3-G020413	2/4/13	**340**	*3.51*	**46,000**	*475*	**410**	*4.2*	200 U		100 U		**9,900**	*158*	***641***
ATR-PM3-G030513	3/5/13	**390**	*4.02*	**44,000**	*454*	**450**	*4.6*	100 U		50 U		**7,100**	*114*	***576***
ATR-PM3-G050213	5/2/13	**340**	*3.51*	**37,000**	*382*	**390**	*4.0*	200 U		100 U		**8,300**	*133*	***522***
ATR-MW72(32)-G030613	3/6/13	**390**	*4.02*	**87,000**	*897*	**620**	*6.4*	200 U		100 U		**8,300**	*133*	***1,041***
ATR-MW72(32)-G050613	5/6/13	**460**	*4.75*	**97,000**	*1,001*	**720**	*7.4*	500 U		250 U		**11,000**	*176*	***1,189***
ATR-MW81(27)-G110512	11/5/12	**270**	*2.79*	**40,000**	*413*	**280**	*2.9*	100 U		**13,000**	*99*	**3,700**	*59*	***576***
ATR-MW81(27)-G010713	1/7/13	**250**	*2.58*	**50,000**	*516*	**320**	*3.3*	100 U		**8,800**	*67*	**7,400**	*118*	***707***
ATR-MW81(27)-G020513	2/5/13	**410**	*4.23*	**47,000**	*485*	**370**	*3.8*	200 U		**10,000**	*76*	**7,300**	*117*	***686***
ATR-MW81(27)-G030613	3/6/13	**420**	*4.33*	**53,000**	*547*	**420**	*4.3*	100 U		**11,000**	*84*	**6,600**	*106*	***745***
ATR-MW81(27)-G050313	5/3/13	**440**	*4.54*	**46,000**	*475*	**370**	*3.8*	200 U		**11,000**	*84*	**6,900**	*110*	***677***

Table 6-3

Summary of Target VOC Analytical and Molecular Concentrations
Performed on the Groundwater Samples Collected from the Pilot Test Performance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	VOCs												
		1,1-DCE (96.94)		cis-1,2-DCE (96.94)		trans-1,2-DCE (96.94)		PCE (165.83)		TCE (131.39)		Vinyl Chloride (62.50)		Total Molar Mass
		µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µmole
ATR-MW81(45)-G120512	12/5/12	**15**	*0.15*	**1,800**	*19*	**10**	*0.10*	10 U		**950**	*7*	**150**	*2.4*	***28***
ATR-MW81(45)-G120512R	12/5/12	**14**	*0.14*	**1,800**	*19*	**11**	*0.11*	10 U		**970**	*7*	**160**	*2.6*	***29***
ATR-MW81(45)-G030513	3/5/13	**34**	*0.35*	**3,900**	*40*	**28**	*0.29*	10 U		**2,300**	*18*	**240**	*3.8*	***62***
ATR-MW81(45)-G050313	5/3/13	**27**	*0.28*	**3,000**	*31*	**22**	*0.23*	20 U		**1,600**	*12*	**180**	*2.9*	***47***
ATR-INJ1-G112812	11/28/12	**240**	*2.48*	**79,000**	*815*	**400**	*4.1*	**190**	*1.1*	**35,000**	*266*	**4,600**	*74*	***1,163***
ATR-INJ1-G030513	3/5/13	**650**	*6.71*	**400,000**	*4,126*	**1,900**	*20*	1,000 U		**33,000**	*251*	**14,000**	*224*	***4,628***
ATR-INJ2-G030613	3/6/13	**28**	*0.29*	**5,700**	*59*	**44**	*0.45*	10 U		**8.8**	*0.07*	**2,400**	*38*	***98***
Down-Gradient Product ABC+ Pilot Test Area														
ATR-MW16-G092612	9/26/12	1 U		**360**	*3.7*	**11**	*0.11*	2 U		**42**	*0.32*	**130**	*2.1*	***6.2***
ATR-MW16-G030613	3/6/13	1 U		**370**	*3.8*	**12**	*0.12*	2 U		**27**	*0.21*	**260**	*4.2*	***8.3***
ATR-MW16-G030613R	3/6/13	1 U		**340**	*3.5*	**12**	*0.12*	2 U		**27**	*0.21*	**210**	*3.4*	***7.2***
ATR-MW16-G040313	4/3/13	1 U		**390**	*4.0*	**12**	*0.12*	2 U		**18**	*0.14*	**290**	*4.6*	***8.9***
ATR-MW16-G050213	5/2/13	1 U		**410**	*4.2*	**13**	*0.13*	2 U		**19**	*0.14*	**200**	*3.2*	***7.7***
ATR-MW17-G092612	9/26/12	1 U		**67**	*0.69*	**2.4**	*0.02*	2 U		**270**	*2.1*	1 U		***2.8***
ATR-MW17-G030613	3/6/13	1 U		**56**	*0.58*	**1.9**	*0.02*	2 U		**200**	*1.5*	1 U		***2.1***
ATR-MW17-G030613R	3/6/13	1 U		**58**	*0.60*	**1.9**	*0.02*	2 U		**220**	*1.7*	**1.7**	*0.03*	***2.3***
ATR-MW17-G040313	4/3/13	1 U		**46**	*0.47*	**1.5**	*0.02*	2 U		**210**	*1.6*	1 U		***2.1***
ATR-MW17-G050213	5/2/13	1 U		**51**	*0.53*	**1.8**	*0.02*	2 U		**190**	*1.4*	1 U		***2.0***
ATR-MW25(16.4)-G092712	9/27/12	5 U		**1,800**	*19*	5 U		10 U		5 U		**630**	*10.1*	***29***
ATR-MW25(16.4)-G030613	3/6/13	5 U		**2,600**	*27*	**15**	*0.15*	10 U		5 U		**560**	*9.0*	***36***
ATR-MW25(16.4)-G050213	5/2/13	10 U		**2,500**	*26*	10 U		20 U		10 U		**520**	*8.3*	***34***
ATR-MW26(17.5)-G092712	9/27/12	**2.8**	*0.03*	**770**	*7.9*	**12**	*0.12*	2 U		**4.1**	*0.03*	**380**	*6.1*	***14***
ATR-MW26(17.5)-G010813	1/8/13	5 U		**1,200**	*12*	**15**	*0.15*	10 U		5 U		**500**	*8.0*	***21***
ATR-MW26(17.5)-G030613	3/6/13	5 U		**1,200**	*12*	**14**	*0.14*	10 U		5 U		**430**	*6.9*	***19***
ATR-MW26(17.5)-G040313	4/3/13	5 U		**1,200**	*12*	**12**	*0.12*	10 U		5 U		**650**	*10.4*	***23***
ATR-MW26(17.5)-G050313	5/3/13	5 U		**880**	*9.1*	**11**	*0.11*	10 U		5 U		**530**	*8.5*	***18***
ATR-MW26(28.8)-G092712	9/27/12	1 U		**45**	*0.46*	**2.2**	*0.02*	2 U		**22**	*0.17*	**13**	*0.21*	***0.9***
ATR-MW26(28.8)-G092712R	9/27/12	1 U		**47**	*0.48*	**2.3**	*0.02*	2 U		**24**	*0.18*	**14**	*0.22*	***0.9***
ATR-MW26(28.8)-G010813	1/8/13	**1.4**	*0.01*	**480**	*5.0*	**9.9**	*0.10*	2 U		1 U		**130**	*2.1*	***7.1***
ATR-MW26(28.8)-G030613	3/6/13	**1.2**	*0.01*	**330**	*3.4*	**10**	*0.10*	2 U		1 U		**150**	*2.4*	***5.9***
ATR-MW26(28.8)-G040313	4/3/13	**1.5**	*0.02*	**460**	*4.7*	**11**	*0.11*	2 U		**1.4**	*0.01*	**240**	*3.8*	***8.7***
ATR-MW26(28.8)-G050313	5/3/13	**2.3**	*0.02*	**490**	*5.1*	**14**	*0.14*	2 U		**1.9**	*0.01*	**200**	*3.2*	***8.4***
ATR-ZVI-1(16.5)-G121812	12/18/12	**2.0**	*0.02*	**740**	*7.6*	**14**	*0.14*	2 U		**3.5**	*0.03*	**180**	*2.9*	***11***
ATR-ZVI-1(16.5)-G010813	1/8/13	1 U		**770**	*7.9*	**11**	*0.11*	2 U		**3.2**	*0.02*	**250**	*4.0*	***12***
ATR-ZVI-1(16.5)-G030613	3/6/13	**2.3**	*0.02*	**710**	*7.3*	**10**	*0.10*	2 U		1 U		**170**	*2.7*	***10***
ATR-ZVI-1(16.5)-G040313	4/3/13	**2.0**	*0.02*	**790**	*8.1*	**8.7**	*0.09*	2 U		1 U		**210**	*3.4*	***12***
ATR-ZVI-1(16.5)-G050313	5/3/13	10 U		**740**	*7.6*	10 U		20 U		10 U		**140**	*2.2*	***10***

Table 6-3

Summary of Target VOC Analytical and Molecular Concentrations
Performed on the Groundwater Samples Collected from the Pilot Test Performance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	VOCs												
		1,1-DCE (96.94)		cis-1,2-DCE (96.94)		trans-1,2-DCE (96.94)		PCE (165.83)		TCE (131.39)		Vinyl Chloride (62.50)		Total Molar Mass
		µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µg/L	*m**	µmole
ATR-ZVI-1(34.5)-G121812	12/18/12	**2.9**	*0.03*	**330**	*3.4*	**10**	*0.10*	2 U		**24**	*0.18*	**160**	*2.6*	***6.3***
ATR-ZVI-1(34.5)-G010813	1/8/13	**2.2**		**290**	*3.0*	**8.8**	*0.09*	2 U		**24**	*0.18*	**140**	*2.2*	***5.5***
ATR-ZVI-1(34.5)-G030613	3/6/13	1 U		**250**	*2.6*	**9.1**	*0.09*	2 U		**15**	*0.11*	**91**	*1.5*	***4.2***
ATR-ZVI-1(34.5)-G040313	4/3/13	**1.6**	*0.02*	**300**	*3.1*	**8.3**	*0.09*	2 U		**15**	*0.11*	**120**	*1.9*	***5.2***
ATR-ZVI-1(34.5)-G050313	5/3/13	**2.1**	*0.02*	**320**	*3.3*	**9.2**	*0.09*	2 U		**7.2**	*0.05*	**160**	*2.6*	***6.0***
ATR-ZVI-2(17.5)-G121812	12/18/12	**2.3**	*0.02*	**1,300**	*13.4*	**12**	*0.12*	2 U		**5.1**	*0.04*	**400**	*6.4*	***20***
ATR-ZVI-2(17.5)-G010813	1/8/13	5 U		**1,200**	*12.4*	**12**	*0.12*	10 U		5 U		**480**	*7.7*	***20***
ATR-ZVI-2(17.5)-G030613	3/6/13	5 U		**1,500**	*15.5*	**13**	*0.13*	10 U		5 U		**460**	*7.4*	***23***
ATR-ZVI-2(17.5)-G040313	4/3/13	5 U		**1,500**	*15.5*	**11**	*0.11*	10 U		5 U		**450**	*7.2*	***23***
ATR-ZVI-2(17.5)-G050313	5/3/13	5 U		**1,500**	*15.5*	**10**	*0.10*	10 U		5 U		**350**	*5.6*	***21***
ATR-ZVI-2(32.5)-G121812	12/18/12	**3.9**	*0.04*	**580**	*6.0*	**10**	*0.10*	2 U		**16**	*0.12*	**210**	*3.4*	***10***
ATR-ZVI-2(32.5)-G010813	1/8/13	**4.2**	*0.04*	**670**	*6.9*	**13**	*0.13*	2 U		**3.2**	*0.02*	**280**	*4.5*	***12***
ATR-ZVI-2(32.5)-G030613	3/6/13	**4.6**	*0.05*	**650**	*6.7*	**16**	*0.17*	2 U		1 U		**280**	*4.5*	***11***
ATR-ZVI-2(32.5)-G030613R	3/6/13	**4.5**	*0.05*	**650**	*6.7*	**16**	*0.17*	2 U		1 U		**280**	*4.5*	***11***
ATR-ZVI-2(32.5)-G040313	4/3/13	**3.6**	*0.04*	**710**	*7.3*	**14**	*0.14*	2 U		1 U		**410**	*6.6*	***14***
ATR-ZVI-2(32.5)-G040313R	4/3/13	**3.5**	*0.04*	**710**	*7.3*	**14**	*0.14*	2 U		1 U		**410**	*6.6*	***14***
ATR-ZVI-2(32.5)-G050313	5/3/13	**3.9**	*0.04*	**600**	*6.2*	**15**	*0.15*	2 U		1 U		**340**	*5.4*	***12***
Other Proposed Treatment Areas														
ATR-MW13-G092712	9/27/12	10 U		**4,900**	*51*	**31**	*0.32*	20 U		10 U		**440**	*7.0*	***58***
ATR-MW13-G050613	5/6/13	10 U		**3000**	*31*	10 U		20 U		10 U		**1600**	*26*	***57***
ATR-MW14-G092712	9/27/12	1 U		**53**	*0.55*	**2.3**	*0.02*	2 U		**390**	*3.0*	**30**	*0.48*	***4.0***
ATR-MW14-G030513	3/5/13	**1.2**	*0.01*	**60**	*0.62*	**2.7**	*0.03*	2 U		**380**	*2.9*	**6.1**	*0.10*	***3.6***
ATR-MW14-G050213	5/2/13	1 U		**55**	*0.57*	**2.3**	*0.02*	2 U		**320**	*2.4*	**4.2**	*0.07*	***3.1***
ATR-MW6C-G092612	9/26/12	10 U		**3,600**	*37*	10 U		20 U		10 U		**1,200**	*19*	***56***
ATR-MW6C-G030513	3/5/13	5 U		**2,400**	*25*	**13**	*0.13*	10 U		5 U		**740**	*12*	***37***
ATR-MW6C-G050713	5/7/13	5 U		**1,800**	*19*	**10**	*0.10*	10 U		5 U		**1,200**	*19*	***38***
ATR-MW6C-G050713R	5/7/13	5 U		**1,800**	*19*	**12**	*0.12*	10 U		5 U		**1,500**	*24*	***43***
ATR-MW67(30)-G092612	9/26/12	20 U		**7,900**	*81*	**69**	*0.71*	40 U		20 U		**870**	*14*	***96***
ATR-MW67(30)-G050613	5/6/13	50 U		**21,000**	*217*	**170**	*1.8*	100 U		50 U		**1800**	*29*	***247***

Notes:
J - Estimated concentration, analyte detected below quantitation limit
U - Analyzed but not detected above the MDL
(96.94) - Compound molecular weight in grams per mole
*m** - micromole
µmole - micromole
µg/L - micrograms per liter

Prepared by: RJC
Checked by: PJS

Table 6-4

Summary of Dechlorinating Bacteria, Functional Genes, Dissolved Gases, and Volatile Fatty Acid Laboratory Analyses Performed on the Groundwater Samples Collected from the Revised Monitoring Well Network During the Baseline Groundwater Monitoring

TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Dechlorinating Bacteria & Functional Genes				Dissolved Gases			Volatile Fatty Acids									
		DHC	tceA Reductase	bvcA Reductase	VC Reductase	Methane	Ethane	Ethene	Lactic Acid	Acetic Acid	Propionic Acid	Formic Acid	Butyric Acid	Pyruvic Acid	i-Pentanoic Acid	Pentanoic Acid	i-Hexanoic Acid	Hexanoic Acid
		cells/mL	cells/mL	cells/mL	cells/mL	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MTR-MW6C-G030513	3/5/13	**2.40E+01***	< 5.00E-01*	**2.36E+01***	< 5.00E-01*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MTR-MW13-G092712	9/27/12	**5.66E+02***	**< 6.80E+00***	8.30E+00*	2.46E+02*	**1,600**	**30**	**21**	**0.032 J**	**1.9**	0.050 U	**0.050 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW14-G092712	9/27/12	**1.08E+01**	**1.19E+01**	< 5.00E-01	< 5.00E-01	**62**	**0.31**	**0.18**	0.10 U	0.070 U	0.050 U	0.10 U	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW25(16.4)-G092712	9/27/12	**2.11E+02**	**7.00E+00**	**5.00E-01**	**7.90E+00**	**1,300**	**20**	**13**	**0.030 J**	**0.038 J**	0.050 U	**0.068 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW26(17.5)-G092712	9/27/12	**2.70E+00**	< 5.00E-01	**2.00E-01 J**	< 5.00E-01	**790**	**25**	**3.2**	0.10 U	**0.0083 J**	0.050 U	**0.037 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW26(17.5)-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	**0.036 J**	**0.91**	**0.15**	**0.047 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	**0.11**
MTR-MW26(17.5)-G050313	5/3/13	**3.33E+04***	**7.19E+04***	**2.39E+03***	**4.05E+02***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MTR-MW26(28.8)-G092712	9/27/12	**1.10E+00**	< 5.00E-01	< 5.00E-01	< 5.00E-01	**120**	**2.6**	**0.043**	**0.036 J**	0.070 U	0.050 U	**0.069 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW26(28.8)-G092712R	9/27/12	NA	NA	NA	NA	**110**	**2.5**	**0.037**	0.10 U	**0.012 J**	0.050 U	**0.055 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
ATR-MW26(28.8)-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	1.0 U	**170**	**100**	**1.4**	**1.7**	**0.84**	**0.54**	**0.16**	0.050 U	0.10 U
ATR-MW26(28.8)-G050313	5/3/13	**1.65E+04***	**2.73E+03***	**8.12E+03***	**5.73E+01***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MTR-MW59(29)-G092712	9/27/12	**3.18E+04**	< 5.00E-01	**2.17E+02**	**3.07E+04**	**11,000**	**240**	**1,600**	**0.022 J**	**0.021 J**	0.050 U	**0.083 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.050 U
MTR-MW59(29)-G092712R	9/27/12	**1.52E+05***	**2.30E+00 J***	**1.66E+03***	**1.48E+05***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MTR-MW59(29)-G020413	2/4/13	NA	NA	NA	NA	NA	NA	NA	**2.8**	**160**	**190**	**6.7 J**	**240**	**6.0**	**3.0**	**6.4**	0.05 U	**4.9**
MTR-MW59(29)-G030613	3/6/13	**2.28E+05***	< 3.60E+00*	**1.68E+05***	**1.20E+03***	**14,000**	**280**	**9,600**	1.0 U	**86**	**97**	**2.5 J**	**120**	**3.9**	**2.2**	**3.9**	0.05 U	**2.5**
MTR-MW59(29)-G050313	5/3/13	NA	NA	NA	NA	**13,000**	**250**	**4,900**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW67(30)-G110712	11/7/12	< 1.43E+01	< 1.43E+01	< 1.43E+01	< 1.43E+01	**1,700**	**75**	**6.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW72(32)-G030613	3/6/13	**3.29E+01***	< 6.30E+00*	**2.17E+01***	< 6.30E+00*	**6,100**	**130**	**770**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(27)-G110512	11/5/12	**2.10E+00 J**	< 1.70E+00	**6.00E-01 J**	< 1.70E+00	**11,000**	**170**	**550**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(27)-G020413	2/4/13	NA	NA	NA	NA	NA	NA	NA	0.10 U	**2.4**	**6.9**	**0.44**	**4.9**	**0.16**	**0.071 J**	**0.24**	0.050 U	0.10 U
ATR-MW81(27)-G030613	3/6/13	**7.17E+03***	< 4.30E+00*	**5.14E+03***	**8.98E+01***	**11,000**	**220**	**640**	**0.20**	**0.80**	**1.2**	**0.12**	**0.89**	**0.066 J**	**0.027 J**	**0.12**	0.050 U	0.10 U
ATR-MW81(27)-G050313	5/3/13	NA	NA	NA	NA	**11,000**	**230**	**760**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM1-G110512	11/5/12	**2.14E+01**	< 1.40E+00	**1.10E+00 J**	**3.50E+00**	**12,000**	**440**	**430**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM1-G020413	2/4/13	NA	NA	NA	NA	NA	NA	NA	**0.070 J**	**0.030 J**	**0.0054 J**	**0.096 J**	0.050 U	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ATR-PM1-G030613	3/6/13	**3.79E+03***	< 5.00E-01*	**2.26E+03***	**8.91E+01***	**17,000**	**660**	**460**	**0.057 J**	**0.10**	**0.0310 J**	**0.074 J**	**0.047 J**	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ATR-PM1-G050313	5/3/13	NA	NA	NA	NA	**15,000**	**560**	**390**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM2-G110512	11/5/12	**4.66E+01**	< 2.50E+00	**5.50E+00**	**2.90E+00**	**10,000**	**180**	**1,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM2-G020413	2/4/13	NA	NA	NA	NA	NA	NA	NA	0.10 U	**0.58**	**0.56**	**0.032 J**	**0.21**	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ATR-PM2-G030613	3/6/13	**4.12E+03***	< 4.00E-01*	**2.71E+03***	**1.18E+02***	**10,000**	**160**	**840**	**0.050 J**	**0.15**	**0.10**	**0.035 J**	**0.059**	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ATR-PM2-G050313	5/3/13	NA	NA	NA	NA	**7,800**	**120**	**620**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM3-G110512	11/5/12	**3.60E+00**	< 1.40E+00	**1.00E+00 J**	< 1.40E+00	**11,000**	**260**	**700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM3-G020413	2/4/13	NA	NA	NA	NA	NA	NA	NA	**0.056 J**	**0.12**	**0.13**	**0.070 J**	**0.042 J**	0.15 U	0.15 U	0.070 U	` U	0.10 U
ATR-PM3-G030513	3/5/13	**3.58E+03***	< 9.00E-01*	**1.95E+03***	**7.81E+02***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM3-G050313	5/3/13	NA	NA	NA	NA	**10,000**	**260**	**680**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6-4

Summary of Dechlorinating Bacteria, Functional Genes, Dissolved Gases, and Volatile Fatty Acid Laboratory Analyses Performed on the Groundwater Samples Collected from the Revised Monitoring Well Network During the Baseline Groundwater Monitoring
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Dechlorinating Bacteria & Functional Genes				Dissolved Gases			Volatile Fatty Acids										
		DHC	**tceA Reductase**	**bvcA Reductase**	**VC Reductase**	**Methane**	**Ethane**	**Ethene**	**Lactic Acid**	**Acetic Acid**	**Propionic Acid**	**Formic Acid**	**Butyric Acid**	**Pyruvic Acid**	**i-Pentianoic Acid**	**Pentanoic Acid**	**i-Hexanoic Acid**	**Hexanoic Acid**
		cells/mL	**cells/mL**	**cells/mL**	**cells/mL**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
ATR-INJ1-G030513	3/5/13	**1.40E+04***	**3.58E+01***	**4.56E+03***	**2.37E+02***	NA	NA	NA	**0.45 J**	**410**	**230**	**9.3 J**	**580**	**19**	**6.7 J**	**35**	0.50 U	**120**
ATR-INJ2-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	**6.8**	**420**	**620**	**57**	**1,700**	**34**	**14 J**	**59**	0.50 U	**84**
ZVI-1(16.5)-G121812	12/18/12	< 5.00E+00	< 5.00E+00	< 5.00E+00	< 5.00E+00	NA	NA	NA	**31**	**450**	**240**	**3.4**	**8.2**	**1.0 J**	**0.55 J**	**0.39 J**	**0.13**	0.1 U
ZVI-1(16.5)-G030613	3/6/13	**1.70E+00***	< 5.00E-01*	< 5.00E-01*	< 5.00E-01*	**540**	**25**	**22**	1.0 U	**91**	**44**	**0.54 J**	**0.72**	**0.41**	**0.39**	**0.090**	0.050 U	0.10 U
ZVI-1(16.5)-G050313	5/3/13	**1.23E+03***	**1.18E+02***	**8.46E+01***	**2.30E+02***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZVI-1(34.5)-G121812	12/18/12	**9.00E-01 J**	< 1.30E+00	< 1.30E+00	< 1.30E+00	NA	NA	NA	**60**	**320**	**78**	**1.3**	**41**	**0.94 J**	1.5 U	**0.13**	**0.090**	0.1 U
ZVI-1(34.5)-G030613	3/6/13	**4.48E+01***	< 4.80E+00*	< 4.80E+00*	< 4.80E+00*	**400**	**6.6**	**0.59**	**0.045 J**	**0.41**	**0.056**	**0.014 J**	**0.052**	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ZVI-1(34.5)-G050313	5/3/13	**5.75E+00***	< 5.00E-01*	**1.00E-01 J***	< 5.00E-01*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZVI-2(17.5)-G121812	12/18/12	1.00E+00	1.00E+00	1.00E+00	1.00E+00	NA	NA	NA	1.0 U	**22**	**18**	**0.36**	**0.088**	**0.034 J**	0.15 U	0.07 U	0.05 U	0.1 U
ZVI-2(17.5)-G030613	3/6/13	**1.15E+01***	**8.83E+00***	< 4.00E-01*	< 4.00E-01*	**930**	**16**	**4.6**	**0.067 J**	**0.23**	**0.0096 J**	**0.023 J**	**0.033 J**	0.15 U	0.15 U	0.070 U	0.050 U	0.10 U
ZVI-2(17.5)-G050313	5/3/13	**1.34E+03***	**5.90E+03***	**1.70E+00***	**5.80E+00***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZVI-2(32.5)-G121812	12/18/12	1.00E+00	1.00E+00	1.00E+00	1.00E+00	NA	NA	NA	**37**	**260**	**98**	**1.2**	**11**	**0.52 J**	0.15 U	**0.10**	0.05 U	0.1 U
ZVI-2(32.5)-G030613	3/6/13	**2.00E+00***	**2.70E+00***	< 1.40E+00*	< 1.40E+00*	**650**	**15**	**10**	**0.044 J**	**31**	**19**	**0.32 J**	**0.27 J**	**0.15**	**0.20**	**0.040 J**	0.050 U	0.10 U
ZVI-2(32.5)-G030613	5/3/13	**1.56E+04***	**7.94E+03***	**8.76E+01***	**7.90E+01***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not Analyzed
NM - Not Measured
J - Estimated concentration, analyte detected below quantitation limit
U - Analyzed but not detected above the MDL
cells/mL - cells per milliliter

mg/L - milligram per liter
µg/L - micro grams per liter
Bold - Indicates measured or laboratory detection
DHC - Dehalococcoides Bacteria
*DHC Sample filtered by Microbial Insights at the laboratory

Prepared By: WDG
Checked By: RLB

Table 6-5

Summary of Inorganic Parameters
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Inorganics														
		Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Arsenic	Cadmium	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Nitrogen, Nitrate	Nitrogen, Nitrite	Selenium	Sulfate	Sulfide
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Source Area Pilot Test																
ATR-MW59(29)-G092712	9/27/12	**140**	**140**	NA	NA	NA	**64**	NA	**2.8**	NA	**0.21**	0.02 U	0.02 U	NA	**3.8**	1 U
ATR-MW59(29)-G122812	12/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(29)-G010713	1/7/13	**570**	**570**	NA	NA	NA	**78**	NA	**27**	NA	**1.4**	**0.057**	0.02 U	NA	**2.7**	**2.2**
ATR-MW59(29)-G020413	2/4/13	**360**	**360**	NA	NA	NA	**120**	NA	**13**	NA	**0.66**	0.02 U	0.02 U	NA	1 U	**1.6**
ATR-MW59(29)-G030613	3/6/13	**270**	**270**	NA	NA	NA	**110**	NA	**8.5**	NA	**0.52**	0.02 U	0.02 U	NA	1 U	1 U
ATR-MW59(29)-G050313	5/3/13	**180**	**180**	0.005 U	0.002 U	**58**	**77**	0.005 U	**1.6**	**17**	**0.54**	0.02 U	0.02 U	0.005 U	2.3	1 U
ATR-MW59(46)-G092612	9/26/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)-G092612R	9/26/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)	12/18/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)	12/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW59(46)-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)-G092612	9/26/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)	12/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)	1/7/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)	2/4/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW60(38)-G050213	5/2/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM1-G110512	11/5/12	**300**	**300**	0.005 U	0.002 U	**62**	**36**	**0.0067**	**4.0**	**15**	**0.68**	0.02 U	0.02 U	0.005 U	**7.9**	1 U
ATR-PM1	12/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM1-G010713	1/7/13	**250**	**250**	NA	NA	NA	**35**	NA	**4.0**	NA	**1.3**	0.02 U	0.02 U	NA	**2.0**	1 U
ATR-PM1-G020413	2/4/13	**280**	**290**	NA	NA	NA	**30**	NA	**4.3**	NA	**1.8**	0.02 U	0.02 U	NA	**2.0**	1 U
ATR-PM1-G030613	3/6/13	**280**	**280**	NA	NA	NA	**37**	NA	**5.6**	NA	**1.9**	0.02 U	0.02 U	NA	**2.0**	1 U
ATR-PM1-G030613R	3/6/13	**280**	**280**	NA	NA	NA	**36**	NA	**5.7**	NA	**1.9**	0.02 U	0.02 U	NA	**2.0**	1 U
ATR-PM1-G050313	5/3/13	**270**	**270**	0.005 U	0.002 U	**67**	**36**	0.005 U	**4.3**	**15**	**1.7**	0.02 U	0.02 U	0.005 U	**1.9**	1 U
ATR-PM1-G050313R	5/3/13	**270**	**270**	0.005 U	0.002 U	**68**	**36**	0.005 U	**4.3**	**15**	**1.7**	0.02 U	0.02 U	0.005 U	**1.8**	1 U

Table 6-5

Summary of Inorganic Parameters
Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Inorganics														
		Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Arsenic	Cadmium	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Nitrogen, Nitrate	Nitrogen, Nitrite	Selenium	Sulfate	Sulfide
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ATR-PM2-G110512	11/5/12	230	230	0.005 U	0.002 U	73	50	0.018	5.4	17	0.58	0.02 U	0.02 U	0.005 U	1.7	1 U
ATR-PM2	12/27/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM2-G010713	1/7/13	400	400	NA	NA	NA	31	NA	5.1	NA	0.64	0.02 U	0.02 U	NA	1.4	1 U
ATR-PM2-G020413	2/4/13	250	260	NA	NA	NA	33	NA	5.0	NA	0.71	0.02 U	0.02 U	NA	1.3	1 U
ATR-PM2-G030613	3/6/13	300	300	NA	NA	NA	28	NA	6.0	NA	0.94	0.02 U	0.02 U	NA	2.7	1 U
ATR-PM2-G050313	5/3/13	300	300	0.005 U	0.002 U	84	26	0.005 U	5.5	17	0.84	0.02 U	0.02 U	0.005 U	7.3	1 U
ATR-PM3-G110512	11/5/12	260	260	0.005 U	0.002 U	70	47	0.026	3.2	22	0.63	0.056	0.02 U	0.005 U	3.9	1 U
ATR-PM3	12/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM3-G010713	1/7/13	240	240	NA	NA	NA	50	NA	1.9	NA	0.61	0.02 U	0.02 U	NA	4.7	1 U
ATR-PM3-G020413	2/4/13	230	230	NA	NA	NA	48	NA	1.6	NA	0.56	0.02 U	0.02 U	NA	3.9	1 U
ATR-PM3-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-PM3-G050213	5/2/13	240	240	0.005 U	0.002 U	57	49	0.005 U	3.7	17	0.53	0.02 U	0.02 U	0.005 U	3.5	1 U
ATR-MW72(32)-G030613	3/6/13	280	280	NA	NA	NA	58	NA	NA	NA	NA	0.036	0.02 U	NA	6.5	NA
ATR-MW72(32)-G050613	5/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(27)-G110512	11/5/12	160	160	0.011	0.002 U	54	51	0.014	5.1	15	0.33	0.02 U	0.02 U	0.005 U	2.9	1 U
ATR-MW81(27)	12/27/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(27)-G010713	1/7/13	230	230	NA	NA	NA	55	NA	5.2	NA	0.53	0.02 U	0.02 U	NA	5.7	1 U
ATR-MW81(27)-G020513	2/5/13	360	360	NA	NA	NA	56	NA	3.2	NA	0.32	0.02 U	0.02 U	NA	5.7	1 U
ATR-MW81(27)-G030613	3/6/13	170	170	NA	NA	NA	60	NA	3.2	NA	0.36	0.02 U	0.02 U	NA	5.1	1 U
ATR-MW81(27)-G050313	5/3/13	180	180	0.005 U	0.002 U	43	61	0.005 U	3.4	16	0.2	0.02 U	0.02 U	0.005 U	3.6	1 U
ATR-MW81(45)-G120512	12/5/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)-G120512R	12/5/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)	12/27/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)	1/7/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW81(45)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6-5

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TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Inorganics														
		Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Arsenic	Cadmium	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Nitrogen, Nitrate	Nitrogen, Nitrite	Selenium	Sulfate	Sulfide
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ATR-INJ1-G112812	11/28/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-INJ1-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-INJ2-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-INJ3-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Down-Gradient Product ABC/ZVI Pilot Test																
ATR-MW16-G092612	9/26/12	**230**	**230**	0.005 U	0.002 U	**59**	**11**	0.005 U	**0.15**	**18**	**0.080**	0.02 U	0.02 U	0.005 U	**12**	1 U
ATR-MW16-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW16-G030613R	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW16-G040313	4/3/13	**510**	**510**	**0.010**	0.002 U	**250**	**14**	0.005 U	**27**	**31**	**1.2**	0.02 U	0.02 U	0.005 U	**9.5**	1 U
ATR-MW16-G050213	5/2/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW17-G092612	9/26/12	**380**	**380**	0.005 U	0.002 U	**93**	**37**	0.005 U	0.08 U	**32**	**0.31**	**0.79**	0.02 U	0.005 U	**25**	1 U
ATR-MW17	12/18/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW17-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW17-G030613R	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW17-G040313	4/3/13	**360**	**360**	0.005 U	0.002 U	**96**	**26**	0.005 U	0.08 U	**33**	**0.32**	**0.44**	0.02 U	0.005 U	**22**	1 U
ATR-MW17-G050213	5/2/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW25(16.4)-G092712	9/27/12	**230**	**240**	NA	NA	NA	**20**	NA	**0.97**	NA	**0.34**	0.02 U	0.02 U	NA	**11**	1 U
ATR-MW25(16.4)	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW25(16.4)-G030613	3/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW25(16.4)-G050213	5/2/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW26(17.5)-G092712	9/27/12	**250**	**250**	0.005 U	0.002 U	**68**	**19**	0.005 U	**2.9**	**20**	**0.24**	0.02 U	0.02 U	0.005 U	**13**	1 U
ATR-MW26(17.5)-G010813	1/8/13	**290**	**290**	NA	NA	NA	**16**	NA	NA	NA	NA	0.02 U	0.02 U	NA	**3.6**	1 U
ATR-MW26(17.5)	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW26(17.5)-G030613	3/6/13	**260**	**260**	0.005 U	0.002 U	**71**	**18**	0.005 U	**2.3**	**20**	**0.42**	0.02 U	0.02 U	0.005 U	**3.2**	1 U
ATR-MW26(17.5)-G040313	4/3/13	**260**	**260**	0.005 U	0.002 U	**68**	**17**	0.005 U	**2.2**	**20**	**0.42**	0.02 U	0.02 U	0.005 U	**3.8**	1 U
ATR-MW26(17.5)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6-5

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Performed on the Groundwater Samples Collected from the Pilot Test Perfomance Monitoring Wells
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Inorganics														
		Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Arsenic	Cadmium	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Nitrogen, Nitrate	Nitrogen, Nitrite	Selenium	Sulfate	Sulfide
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ATR-MW26(28.8)-G092712	9/27/12	**250**	**250**	0.005 U	0.002 U	**68**	**11**	0.005 U	**0.15**	**20**	**0.093**	0.02 U	0.02 U	0.005 U	**21**	1 U
ATR-MW26(28.8)-G092712R	9/27/12	**240**	**240**	0.005 U	0.002 U	**68**	**11**	0.005 U	0.08 U	**20**	**0.091**	0.02 U	0.02 U	0.005 U	**21**	1 U
ATR-MW26(28.8)	12/18/12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW26(28.8)-G010813	1/8/13	**520**	**520**	NA	NA	NA	**15**	NA	NA	NA	NA	0.02 U	0.02 U	NA	1 U	1 U
ATR-MW26(28.8)	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW26(28.8)-G030613	3/6/13	**420**	**420**	**0.0061**	0.002 U	**160**	**18**	**0.0072**	**5.4**	**23**	**2.0**	0.02 U	0.02 U	0.005 U	**5.0**	1 U
ATR-MW26(28.8)-G040313	4/3/13	**410**	**410**	**0.0051**	0.002 U	**150**	**20**	**0.0061**	**6.7**	**25**	**1.6**	0.02 U	0.02 U	0.005 U	**5.1**	1 U
ATR-MW26(28.8)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-ZVI-1(16.5)-G121812	12/18/12	**780**	**780**	NA	NA	NA	**18**	NA	**23**	NA	**5.7**	0.02 U	0.02 U	NA	**1.5**	1 U
ATR-ZVI-1(16.5)-G010813	1/8/13	**420**	**420**	**0.0062**	0.002 U	**200**	**18**	**0.015**	**25**	**30**	**3.6**	0.02 U	0.02 U	0.005 U	**1.4**	1 U
ATR-ZVI-1(16.5)-G030613	3/6/13	**310**	**320**	**0.0066**	0.002 U	**98**	**18**	**0.0059**	**13**	**24**	**0.88**	0.02 U	0.02 U	0.005 U	**1.5**	1 U
ATR-ZVI-1(16.5)-G040313	4/3/13	**300**	**300**	**0.0060**	0.002 U	**88**	**16**	0.005 U	**11**	**25**	**0.65**	0.02 U	0.02 U	0.005 U	**1.5**	1 U
ATR-ZVI-1(16.5)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-ZVI-1(34.5)-G121812	12/18/12	**560**	**560**	NA	NA	NA	**12**	NA	**15**	NA	**0.77**	0.02 U	0.02 U	NA	**13**	1 U
ATR-ZVI-1(34.5)-G010813	1/8/13	**350**	**350**	0.005 U	0.002 U	**120**	**10**	0.005 U	**3.3**	**31**	**0.26**	0.02 U	0.02 U	0.005 U	**11**	1 U
ATR-ZVI-1(34.5)-G030613	3/6/13	**240**	**240**	0.005 U	0.002 U	**65**	**12**	0.005 U	**0.31**	**21**	**0.074**	0.02 U	0.02 U	0.005 U	**13**	1 U
ATR-ZVI-1(34.5)-G040313	4/3/13	**240**	**240**	0.005 U	0.002 U	**67**	**12**	0.005 U	**0.42**	**20**	**0.077**	0.02 U	0.02 U	0.005 U	**13**	1 U
ATR-ZVI-1(34.5)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-ZVI-2(17.5)-G121812	12/18/12	**330**	**330**	NA	NA	NA	**19**	NA	**3.0**	NA	**1.2**	0.02 U	0.02 U	NA	**5.7**	1 U
ATR-ZVI-2(17.5)-G010813	1/8/13	**300**	**300**	0.005 U	0.002 U	**96**	**18**	0.005 U	**4.2**	**25**	**1.0**	0.02 U	0.02 U	0.005 U	**5.0**	1 U
ATR-ZVI-2(17.5)-G030613	3/6/13	**250**	**250**	**0.0079**	0.002 U	**74**	**19**	0.005 U	**9.0**	**20**	**0.60**	0.02 U	0.02 U	0.005 U	**4.8**	1 U
ATR-ZVI-2(17.5)-G040313	4/3/13	**260**	**260**	0.005 U	0.002 U	**76**	**18**	0.005 U	**4.0**	**21**	**0.56**	0.02 U	0.02 U	0.005 U	**7.3**	1 U
ATR-ZVI-2(17.5)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6-5

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TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Sample ID	Sample Date	Inorganics														
		Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Total (as CaCO3)	Arsenic	Cadmium	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Nitrogen, Nitrate	Nitrogen, Nitrite	Selenium	Sulfate	Sulfide
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ATR-ZVI-2(32.5)-G121812	12/18/12	**540**	**540**	NA	NA	NA	**12**	NA	**4.7**	NA	**0.66**	0.02 U	0.02 U	NA	**3.6**	1 U
ATR-ZVI-2(32.5)-G010813	1/8/13	**350**	**350**	0.005 U	0.002 U	**110**	**11**	0.005 U	**2.5**	**31**	**0.42**	0.02 U	0.02 U	0.005 U	1 U	1 U
ATR-ZVI-2(32.5)-G030613	3/6/13	**270**	**280**	0.005 U	0.002 U	**87**	**11**	0.005 U	**2.2**	**18**	**0.33**	0.02 U	0.02 U	0.005 U	**2.0**	1 U
ATR-ZVI-2(32.5)-G030613R	3/6/13	**280**	**280**	0.005 U	0.002 U	**84**	**11**	0.005 U	**2.2**	**18**	**0.32**	0.02 U	0.02 U	0.005 U	**2.0**	1 U
ATR-ZVI-2(32.5)-G040313	4/3/13	**270**	**270**	0.005 U	0.002 U	**80**	**11**	0.005 U	**2.1**	**18**	**0.29**	0.02 U	0.02 U	0.005 U	**2.9**	1 U
ATR-ZVI-2(32.5)-G040313R	4/3/13	**270**	**270**	0.005 U	0.002 U	**77**	**11**	0.005 U	**1.9**	**17**	**0.28**	0.02 U	0.02 U	0.005 U	**3.0**	1 U
ATR-ZVI-2(32.5)-G050313	5/3/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other Proposed Treatment Areas																
ATR-MW13-G092712	9/27/12	**200**	**200**	NA	NA	NA	**24**	NA	**75**	NA	**1.3**	**0.78**	0.02 U	NA	**8.4**	1 U
ATR-MW13	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW13-G050613	5/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW14-G092712	9/27/12	**250**	**260**	NA	NA	NA	**7.1**	NA	0.08 U	NA	**0.44**	0.02 U	0.02 U	NA	**14**	1 U
ATR-MW14	2/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW14-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW14-G050213	5/2/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW6C-G092612	9/26/12	**250**	**250**	NA	NA	NA	**15**	NA	**0.51**	NA	**0.21**	0.02 U	0.02 U	NA	**9.1**	1 U
ATR-MW6C-G030513	3/5/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW6C-G050713	5/7/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW6C-G050713R	5/7/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ATR-MW67(30)-G092612	9/26/12	**370**	**380**	NA	NA	NA	**16**	NA	**170**	NA	**2.7**	**2.2**	0.02 U	NA	**20**	1 U
ATR-MW67(30)-G050613	5/6/13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NA - Not Analyzed/Not Applicable
NM - Not Measured
J - Estimated concentration, analyte detected below quantitation limit
U - Analyzed but not detected above the MDL
mS/cm - milliSiemen per centimeter
µg/L - micro grams per liter

Prepared by: RJC
Checked by: PJS

Table 6-6

Results of Total Iron, TOC, and Moisture Performed on Soil Samples Collected from Soil Borings B86, B87, B88, ZVI-1, and ZVI-2 TORX Facility, 4366 N. Old Highway 31, Rochester, Indiana

Sample	Sample Depth (feet)	Date	Total Iron (mg/kg)	TOC (mg/kg)	Percent Moisture (%)
B87 (9-19)-1	9.0 - 12.7	12/01/2012	170,000	0.041	12
B87 (19-29)-2	20.0 - 24.8	12/01/2012	2,800	<0.030	17
B87 (29-39)-1	30.0 - 33.6	12/01/2012	3,600	0.032	17
B87 (29-39)-3	36.5 - 39.0	12/01/2012	5,400	<0.030	16
B87 (49-59)-3	55.6 - 59.0	12/01/2012	4400	<0.030	18
B88 (9-19)-2	12.7 - 15.7	12/01/2012	16,000	0.13	10
B88 (9-19)-3	15.7 - 19.0	12/01/2012	5,200	0.081	20
B88 (19-29)-3	26.0 - 29.0	12/01/2012	5,900	0.035	7.8
B88 (29-39)-4	37.5 - 39.0	12/01/2012	3,900	0.071	17
ZVI1 (9-19)-2	15.0 - 18.7	12/02/2012	7,000	<0.028	12
ZVI1 (19-29)-2	21.5 - 25.5	12/02/2012	3,400	<0.030	18
ZVI1 (29-39)-2	30.5 - 32.5	12/02/2012	4,500	<0.028	12
ZVI1 (29-39)-5	36.0 - 39.0	12/02/2012	3,300	<0.030	16
ZVI2 (9-19)-3	15.5 - 19.0	12/01/2012	13,000	0.083	11
ZVI2 (19-29)-2	23.0 - 25.5	12/01/2012	4,000	0.067	19
ZVI2 (29-39)-2	33.0 - 34.0	12/01/2012	4,500	<0.029	14
ZVI2 (29-39)-5	37.0 - 39.0	12/01/2012	3,600	<0.030	16

Notes:
TOC - Total organic carbon
mg/kg - milligrams per kilogram

Prepared by: RJC
Checked by: PJS

Table 6-7

Summary of Sub-Slab Depressurization Pilot Test
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Test Location	Sample Date	Time	Extraction Well		Monitoring Location										
					VP-1	**VP-2**	**VP-3**	**VP-4**	**VP-5**	**VP-6**	**VP-7**	**TP-1**	**TP-2**	**TP-3**	**TP-4**
			Flow	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**	**"WC**
Winter Background Readings	12/18/12	1000	NA	NA	0.022	0.019	0.029	0.006	0.027	0.042	0.054	0.052	0.047	0.047	0.021
VE1 (Step Test #1)	12/18/12	1050	8.8	**-5.0**	0.02	0.03	0.03	0	0	0	0.04	**-0.05**	0	>0	>0
VE1 (Step Test #2)	12/18/12	1200	27.2	**-10**	0.02	0.02	0.025	0	0	**-0.015**	0.035	**-0.10**	0	>0	>0
VE1 (Step Test #3)	12/18/12	1310	48.5	**-20**	0.03	0.03	0.03	0.01	>0	**-0.05**	0.03	**-0.25**	>0	>0	>0
VE1 (Step Test #4)	12/18/12	1420	57.1	**-23**	0.011	0.012	0.033	0	0.029	**-0.049**	0.038	**-0.27**	0.036	0.046	0.046
VE1 (Step Test #5)	12/18/12	1520	109	**-40**	0.03	0	0.029	0	0.035	**-0.088**	0.047	**-0.386**	0.013	0.03	0.037
Summer Background Readings	6/25/13-6/26/13	varies	NA	NA	0.019	0.001	NM	NM	0.007	0.02	0.004	NA	NA	NA	NA
D23	6/25/13	1050	121	**-11**	NM	NM	NM	NM	NM	**-0.049**	NM	NA	NA	NA	NA
F21	6/25/13	1357	56.1	**-26**	NM	NM	NM	NM	**-0.004**	**-1.367**	NM	NA	NA	NA	NA
F19	6/25/13	1723	64	**-27**	-0.018	NM	NM	NM	NM	**-0.01**	**-0.085**	NA	NA	NA	NA
		1732	31	**-11.5**	-0.007	NM	NM	NM	NM	**-0.003**	**-0.064**	NA	NA	NA	NA
B21	6/26/13	1005	64	**-12**	**-0.031**	NM	NM	NM	NM	**-0.074**	**-0.01**	NA	NA	NA	NA
H21	6/26/13	1218	23.1	**-12**	**-0.008**	NM	NM	NM	**-0.006**	**-0.012**	**-0.017**	NA	NA	NA	NA
		1230	57.1	**-34**	0	NM	NM	NM	NM	**-0.041**	**-0.069**	NA	NA	NA	NA

Notes:
NA - Not Analyzed/Not Applicable
NM - Not Measured
"WC - Inches Water Column
Flow in standard cubic feet per minute

Prepared by: RJC
Checked by: PJS

Table 6-8

SSD Pilot Test Vapor Analytical Data and Calculated Contaminant Removal
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Location	Units	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	VC	Benzene	Chloroform	Total Xylenes	Total HAPs (1)	Total VOCs (2)
12/18/12 Test #1												
Concentrations	mg/m^3	1.10 ^{J}	190.0	1.80 ^{J}	4.60 ^{J}	48.0	0.210	0.024	0.210	0.147	53	248
Influent Flow Rate	scfm	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Mass Contaminant Removal	lb/hr	0.000036	0.006263	0.000059	0.000152	0.001582	0.000007	0.000001	0.000007	0.000005	0.001753	0.008184
	lbs/day	0.000870	0.150304	0.001424	0.003639	0.037972	0.000166	0.000019	0.000166	0.000116	0.042	0.196
	ton/year	0.0002	0.0274	0.0003	0.0007	0.0069	0.00003	0.00000	0.00003	0.00002	0.00768	0.036
12/18/12 Test #2												
Concentrations	mg/m^3	1.10 ^{J}	150.0	1.50 ^{J}	3.80 ^{J}	41.0	0.230	0.019	0.170	0.022 (3)	45	198
Influent Flow Rate	scfm	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1
Mass Contaminant Removal	lb/hr	0.000235	0.032081	0.000321	0.000813	0.008769	0.000049	0.000004	0.000036	0.000005	0.0097	0.0424
	lbs/day	0.005646	0.769950	0.007699	0.019505	0.210453	0.001181	0.000098	0.000873	0.000113	0.232	1.018
	ton/year	0.0010	0.1405	0.0014	0.0036	0.0384	0.0002	0.0000	0.0002	0.0000	0.0424	0.186
Projected PTE (600 scfm)												
Concentrations (from Test #1)	mg/m^3	1.10 ^{J}	190.0	1.80 ^{J}	4.60 ^{J}	48.0	0.210	0.024	0.210	0.147	53	248
Influent Flow Rate	scfm	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0
Mass Contaminant Removal	lb/hr	0.002472	0.427001	0.004045	0.010338	0.107874	0.000472	0.000054	0.000472	0.000330	0.1195	0.5580
	lbs/day	0.059331	10.248021	0.097087	0.248110	2.588974	0.011327	0.001294	0.011327	0.007929	2.869	13.391
	ton/year	0.0108	1.8703	0.0177	0.0453	0.4725	0.0021	0.0002	0.0021	0.0014	0.5236	2.444

Notes:

J = Estimated value

scfm = Standard cubic foot per minute

mg/m^3 - milligrams per cubic meter

lbs/day and lbs/hr = pounds per day and pounds per hour

ton/yr = tons per year

PTE - Potential to emit

(1) HAP - Hazardous air pollutants, includes benzene, chloroform, xylenes, PCE, TCE, and vinyl chloride

(2) See analytical report for all VOCs tested

(3) Compound of interest was not detected. Value used is one-half of the method detection limit for the compound of interest

Prepared by: RJC
Checked by: PJS

Table 8-1

Source Area Injection Well Construction Details
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Array	Well ID	Screen Length (ft)	Bottom of Screen Elevation (ft NAVD 88)	Top of Screen Elevation (ft NAVD 88)	Total Borehole Depth (ft bgs)	Bottom of Well (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft bgs)	Top of Filter Pack (ft bgs)	Top of Filter Seal (ft bgs)
Nested Injection Wells-Source Treatment Zone - Outside										
Array A	1	5	772	777	42	27.3	27	22	20	18
	10	5	758	763		41.3	41	36	34	32
	2	5	773	778	42	26.3	26	21	19	17
	11	5	758	763		41.3	41	36	34	32
	3R	5	772	777	44	27.3	27	22	20	18
	12	5	756	761		43.3	43	38	36	34
	4	5	775	780	38	24.3	24	19	17	15
	14	5	762	767		37.3	37	32	30	28
	13	5	762	767	38	37.3	37	32	30	28
Array B	5	5	778	783	55	31.3	31	26	24	22
	15	5	755	760		54.3	54	49	47	45
	6	5	778	783	55	31.3	31	26	24	22
	16	5	755	760		54.3	54	49	47	45
	7	5	778	783	55	31.3	31	26	24	22
	17	5	755	760		54.3	54	49	47	45
	8	5	778	783	55	31.3	31	26	24	22
	18	5	755	760		54.3	54	49	47	45
	9	5	778	783	55	31.3	31	26	24	22
	19	5	755	760		54.3	54	49	47	45
Injection Wells-Source Treatment Zone - Inside										
Array C	1 to 8	5	778	783	33	32.3	32	27	25	23
Array D	9 to 16	5	778	783	33	32.3	32	27	25	23
Array E	17 to 23	5	778	783	33	32.3	32	27	25	23
Array F	24 to 32	5	778	783	33	32.3	32	27	25	23
Array G	33 to 39	5	778	783	33	32.3	32	27	25	23
Array H	40 to 45	5	778	783	33	32.3	32	27	25	23

Prepared by: JP
Checked by: WPT

Table 8-2

Downgradient Area Injection Well Construction Details
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Array	Well ID	Screen Length (ft)	Bottom of Screen Elevation (ft NAVD 88)	Top of Screen Elevation (ft NAVD 88)	Total Borehole Depth (ft bgs)	Bottom of Well (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft bgs)	Top of Filter Pack (ft bgs)	Top of Filter Seal (ft bgs)
Nested Injection Wells - Treatment Zone A										
Array I	1 to 6	5	777	782	48	32.3	32	27	25	23
	1 to 6	10	762	772		47.3	47	37	35	33
Array J	7 to 12	5	778	783	48	32.3	32	27	25	23
	7 to 12	10	763	773		47.3	47	37	35	33
Array K	13 to 18	5	778	783	47	31.3	31	26	24	22
	13 to 18	10	763	773		46.3	46	36	34	32
Array L	19 to 24	5	778	783	46	30.3	30	25	23	21
	19 to 24	10	763	773		45.3	45	35	33	31
Array M	25 to 29	5	778	783	46	30.3	30	25	23	21
	25 to 29	10	763	773		45.3	45	35	33	31
Array N	30 to 34	5	778	783	46	30.3	30	25	23	21
	30 to 34	10	763	773		45.3	45	35	33	31
Nested Injection Wells - Treatment Zone B										
Array O	1 to 4	10	770	780	36	35.3	35	25	23	21
	1 to 4	10	758	768	48	47.3	47	37	35	33
Array P	5 to 9	10	770	780	36	35.3	35	25	23	21
	5 to 9	10	758	768	48	47.3	47	37	35	33
	9	5	750	755	56	55.3	55	50	48	46
Array Q	10 to 14	10	770	780	34	33.3	33	23	21	19
	10 to 14	10	758	768	46	45.3	45	35	33	31
	14	5	750	755	54	53.3	53	48	46	44
Array R	15 to 17	10	770	780	33	32.3	32	22	20	18
	15 to 17	10	758	768	45	44.3	44	34	32	30
	15 to 17	5	748	753	55	54.3	54	49	47	45

Table 8-2

Downgradient Area Injection Well Construction Details
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Array	Well ID	Screen Length (ft)	Bottom of Screen Elevation (ft NAVD 88)	Top of Screen Elevation (ft NAVD 88)	Total Borehole Depth (ft bgs)	Bottom of Well (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft bgs)	Top of Filter Pack (ft bgs)	Top of Filter Seal (ft bgs)
Nested Injection Wells - Treatment Zone C										
Array S	1 to 5	10	764	774	51	28.3	28	18	16	14
	1 to 5	10	745	755		50.3	50	40	38	36
Array T	6 to 10	10	764	774	55	27.3	27	17	15	13
	6 to 10	10	740	750		54.3	54	44	42	40
Nested Injection Wells - Treatment Zone D										
Array U	1 to 5	5	778	783	48	14.3	14	9	7	5
	1 to 5	5	760	765		32.3	32	27	25	23
	1 to 5	5	745	750		47.3	47	42	40	38
Array V	1 to 5	5	778	783	48	14.3	14	9	7	5
	1 to 5	5	760	765		32.3	32	27	25	23
	1 to 5	5	745	750		47.3	47	42	40	38
Array W	6 to 15	3	778	781	48	14.3	14	9	7	5
	6 to 15	5	761	766		32.3	32	27	25	23
	6 to 15	5	745	750		47.3	47	42	40	38
Array X	16 to 26	3	778	781	48	14.3	14	9	7	5
	16 to 26	5	761	766		32.3	32	27	25	23
	16 to 26	5	745	750		47.3	47	42	40	38
Array Y	27 to 30	5	775	780	51	17.3	17	12	10	8
	27 to 30	5	763	768		30.3	30	25	23	21
	27 to 30	5	742	747		50.3	50	45	43	41
Array Z	31 to 33	5	775	780	51	17.3	17	12	10	8
	31 to 33	5	763	768		30.3	30	25	23	21
	31 to 33	5	742	747		50.3	50	45	43	41

Prepared by: JP
Checked by: WPT

Table 8-3

Monitoring Well Construction Details
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

	Screen Length (ft)	Bottom of Screen Elevation (ft NAVD 88)	Top of Screen Elevation (ft NAVD 88)	Total Borehole Depth (ft bgs)	Bottom of Well (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft bgs)	Top of Filter Pack (ft bgs)	Top of Filter Seal (ft bgs)
(1) Nested Monitoring Well - Treatment Zone A									
OW-1 (777)	5	778	783	~46	~30.3	30	25	≤23	≤21
OW-1 (762)	10	763	773		~45.3	45	35	≤33	≤31.3
(1) Nested Monitoring Well - Treatment Zone B									
OW-2 (773)	5	773	778	~53	~32.3	32	27	≤25	≤21
OW-2 (753)	10	753	763		~52.3	52	42	≤40	≤33.3
(2) Nested Monitoring Wells - Treatment Zone C									
OW-3 (763)	5	763	768	~53	~32.3	32	27	≤25	≤21
OW-3 (743)	10	743	753		~52.3	52	42	≤40	≤33.3
OW-4 (763)	5	763	768	~53	~32.3	32	27	≤25	≤21
OW-4 (743)	10	743	753		~52.3	52	47	≤45	≤33.3
(1) Nested Monitoring Well - Treatment Zone D									
OW-5 (778)	5	778	783	~47	~13.3	13	8	≤6	≤4
OW-5 (760)	5	760	765		~31.3	31	26	≤24	≤14.3
OW-5 (745)	5	745	750		~46.3	46	41	≤39	≤32.3

Prepared by: JP
Checked by: WPT

Table 11-1

Biostimulation Post Injection Performance Monitoring Parameters
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Frequency	**Third Month and Sixth Month after Injections**						**Ninth and Twelfth Month after Injections**						
Treatment Areas	Source Zone Behind Plant	Source Zone Inside Plant	Zone A	Zone B	Zone C	Zone D	**Treatment Areas**	Source Zone Behind Plant	Source Zone Inside Plant	Zone A	Zone B	Zone C	Zone D
Objectives	Evaluate changes in aquifer chemistry and VOC concentrations in groundwater						**Objectives**	Evaluate Changes in VOC concentrations, Organic substrate, and ERD end products in groundwater					
Fixed Laboratory Analyses							**Fixed Laboratory Analyses**						
VOCs(1); TOC(2); Dissolved Gases(3) Metals(4); Alkalinity(5) Anions(6) DHC(7) VFAs(8)	4 Wells	7 Wells	9 Wells	7 Wells	6 Wells	10 Wells	VOCs; TOC; Dissolved Gases	4 Wells	7 Wells	9 Wells	7 Wells	6 Wells	10 Wells
	MW-81(27); MW-59(29); PM-2; PM-3	MW-67; MW-68; MW-71; MW-72; MW-76; MW-77; MW-78	MW-6C; MW-12; MW-13; MW-62: MW-20(35); MW-20(51); MW-82; OW-1(s); OW-1(d)	MW-14; MW-24(24.9); MW-24(55.4); OW-2(s); OW-2(d); OW-3(s); OW-3(d)	MW-15; MW-25(16.4); MW-25(32.6); MW-25(45.2); OW-4(s); OW-4(d)	MW-16; MW-17; MW-26(17.5); MW-26(28.8); MW-26(58.2); ZVI-2(17.5); ZVI-2(32.5); OW-5(s); OW-5(I); OW-5(d)		MW-81(27); MW-59(29); PM-2; PM-3	MW-67; MW-68; MW-71; MW-72; MW-76; MW-77; MW-78	MW-6C; MW-12; MW-13; MW-62: MW-20(35); MW-20(51); MW-82; OW-1(s); OW-1(d)	MW-14; MW-24(24.9); MW-24(55.4); OW-2(s); OW-2(d); OW-3(s); OW-3(d)	MW-15; MW-25(16.4); MW-25(32.6); MW-25(45.2); OW-4(s); OW-4(d)	MW-16; MW-17; MW-26(17.5); MW-26(28.8); MW-26(58.2); ZVI-2(17.5); ZVI-2(32.5); OW-5(s); OW-5(I); OW-5(d)
Field Readings							**Field Readings**						
Water Level(9)	x	x	x	x	x	x	Water Level	x	x	x	x	x	x
ORP(10)	x	x	x	x	x	x	ORP	x	x	x	x	x	x
pH	x	x	x	x	x	x	pH	x	x	x	x	x	x
Cond.	x	x	x	x	x	x	Cond.	x	x	x	x	x	x
Temperature	x	x	x	x	x	x	Temperature	x	x	x	x	x	x
DO(11)	x	x	x	x	x	x	DO	x	x	x	x	x	x
Turbidity	x	x	x	x	x	x	Turbidity	x	x	x	x	x	x

(1) - VOCs: volatile organic compounds (Method 8260)
(2) - TOC: total organic carbon (Method 9060)
(3) - Dissolved gases include methane, ethane, and ethene (Method AM20GAX)
(4) - Iron and Manganese (Method 6020A)
(5) - Alkalinity (Method A2320B)
(6) - Anions include chloride sulfate, nitrate, and chloride (Method SW9056)
(7) - DHCs: dehalococcoides [Quantitative Polymerase Chain Reaction (qPCR)]
(8) - VFAs: volatile fatty acids (Method AM23G)
(9) - Depth to water measurements using a water level indicator
(10) - ORP: Oxidation Reduction Potential
(11) - DO: Dissolved Oxygen

Prepared by: RJC
Checked by: PJS

Table 11-2

Monitoring Well Network for Plume Stability Assessment Monitoring TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well ID	Justification
Messenger Wells	
MW-6C	Treatment Zone A
OW-1(d)	Treatment Zone A
OW-2(s)	Treatment Zone B
OW-2(d)	Treatment Zone B
MW-14	Treatment Zone B
Perimeter of Compliance Wells	
MW-17	POC Well
MW-26(17.5)	POC Well
MW-26(28.8)	POC Well
MW-26(58.2)	POC Well
MW-27(18)	POC Well
Downgradient Well	
MW-30(41.1)	Off-site Well

Prepared by: RJC
Checked by: PJS

Table 11-3

Monitoring Well Network for Whole Plume Evaluation Monitoring
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well ID	Rational
MW-59(29)	Source Area
MW-81(27)	Source Area
MW-68	Source Area
MW-72	Source Area
MW-20(51)	Treatment Area A

The monitoring wells will be sampled on a semi-annual basis

Prepared by: RJC
Checked by: PJS

Table 11-4

Monitoring Well Network for Annual Groundwater Monitoring
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Monitoring Well ID	Monitoring Well ID	Monitoring Well ID
MW-1	MW-31(30.9)	MW51(70)
MW-3	MW-31(55.5)	MW52(55)
MW-6C	MW-31(98.5)	MW52(148)
MW-9B	MW-31(139.2)	MW53(41)
MW-9C	MW-32(24.1)	MW55(49)
MW-11	MW-32(89)	MW56(51)
MW-12	MW-32(110)	MW57(38)
MW-13	MW-34(37)	MW59(29)
MW-14	MW-34(85)	MW59(46)
MW-15	MW-34(110)	MW60(38)
MW-16	MW-35(45)	MW62(36)
MW-17	MW-35(90)	MW65(32)
MW-19(53)	MW-35(148)	MW67(30)
MW-20(35)	MW-36(35.2)	MW68(32)
MW-20(51)	MW-36(92.4)	MW71(33)
MW-20(124)	MW-36(124.5)	MW72(32)
MW-20(155)	MW-37(23.3)	MW75(32)
MW-24(55.4)	MW-37(70)	MW76(30)
MW-25(16.4)	MW-37(98)	MW77(41)
MW-25(32.6)	MW-38(20.8)	MW78(35)
MW-25(82)	MW-38(29.1)	MW79(30)
MW-26(17.5)	MW-38(69.9)	MW80(19)
MW-26(58.2)	MW-38(102.5)	MW81(27)
MW-27(18)	MW-39(13)	MW81(45)
MW-27(53.05)	MW-39(29.3)	MW82(58)
MW-27(75.4)	MW-39(76.8)	MW83(64)
MW-27(104.2)	MW-45 (185)	MW84(44)
MW-29(82.5)	MW48(159)	MW84(68)
MW-29(103.3)	MW50(45)	MW85(39)
MW-29(132.8)	MW50(80)	MW85(130)
MW-30(41.1)	MW51(25)	MW89(28)

Prepared By: WDG
Checked By: PJS

APPENDIX C

HISTORIC GROUNDWATER CONTOUR MAPS

Groundwater Contour Map, Shallow Overburden Wells, April 5, 2010

Groundwater Contour Map, Shallow Overburden Wells, December 6, 2010

Groundwater Contour Map, Shallow Overburden Wells, September 19, 2011

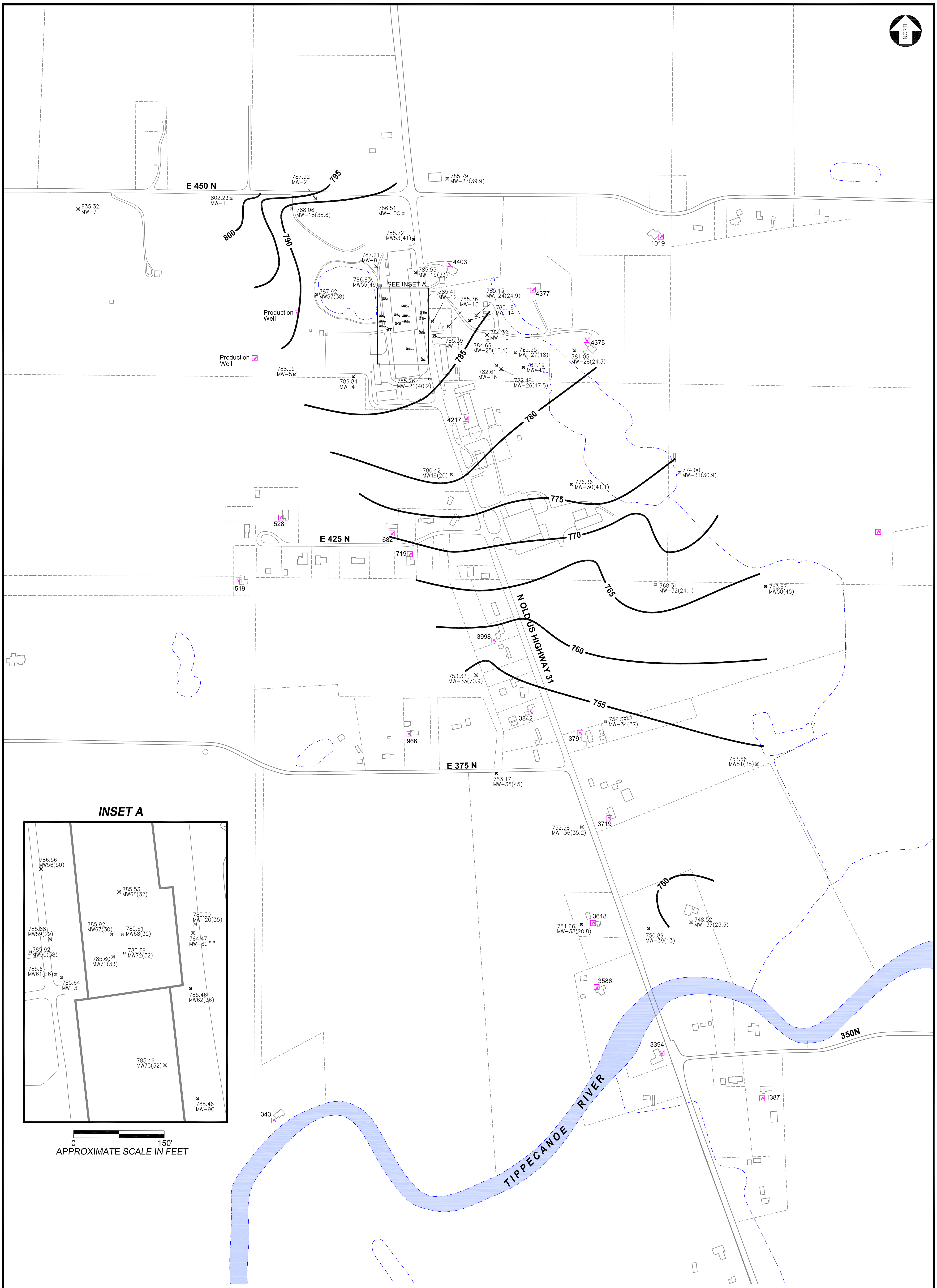
Groundwater Contour Map, Shallow Overburden Wells, April 9, 2012

Groundwater Contour Map, Deep Overburden Wells, April 5, 2010

Groundwater Contour Map, Deep Overburden Wells, December 6, 2010

Groundwater Contour Map, Deep Overburden Wells, September 19, 2011

Groundwater Contour Map, Deep Overburden Wells, April 9, 2012



LEGEND

⌖ 753.17 MW-35(45) — Groundwater Elevation (feet AMSL) Monitoring Well ID and Screen Depth

** — Not Used for Contouring

775 — Potentiometric Surface Contour (feet) (dashed where inferred)

W — Potable Water Well Location

3618 — Street Address

Approximate Property Boundary (from the Fulton County GIS website)

Note: Only shallow overburden monitoring wells are shown.

0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg		
APPROVED BY	DATE 06/24/2010		
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.			
PROJECT NO. 3359 09 2469	SCALE SEE ABOVE		

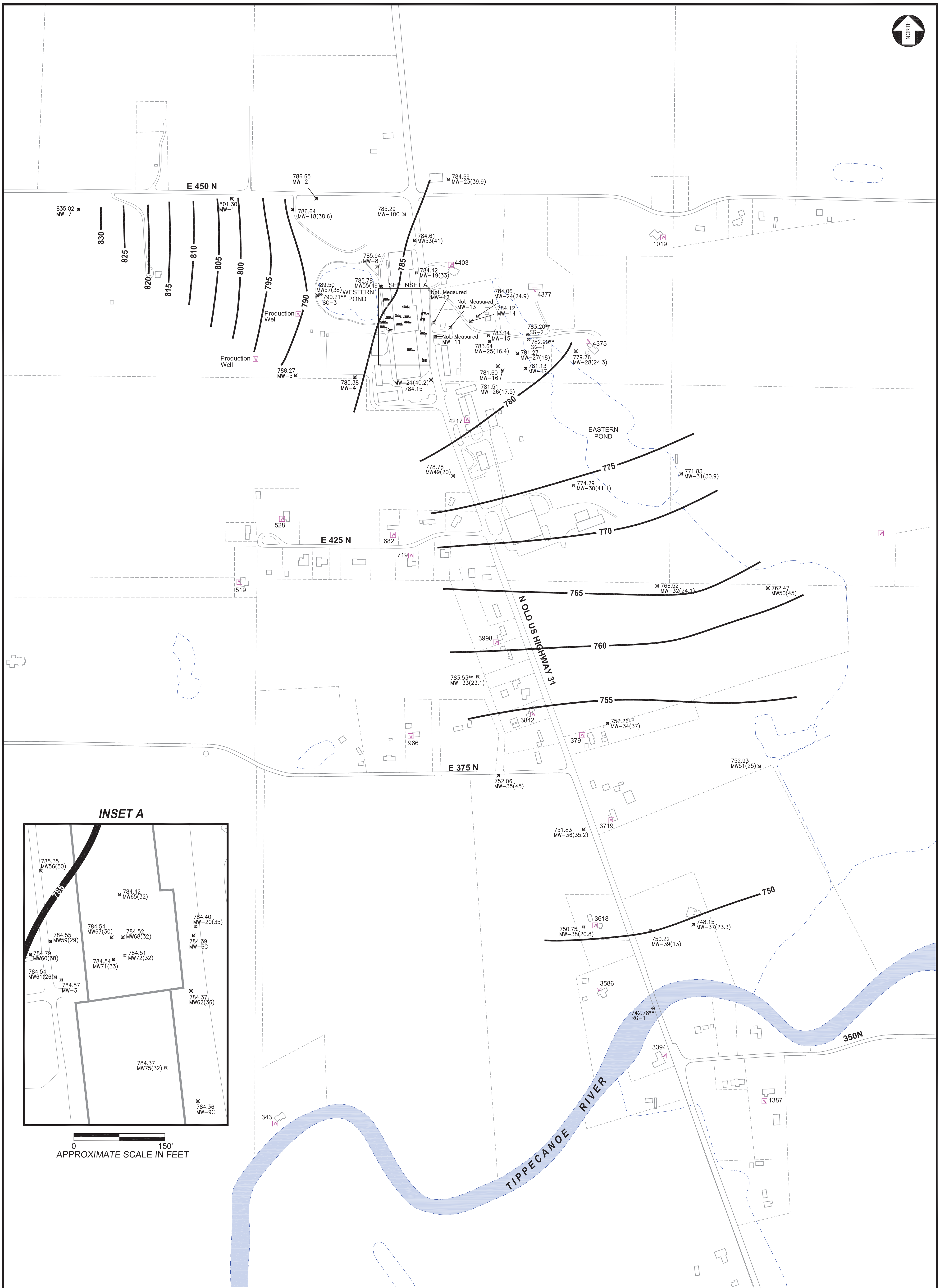
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

MACTEC
521 Byers Road Suite 204
Miamisburg, Ohio 45342
(937) 859-3600 FAX (937) 859-7951

POTENTIOMETRIC SURFACE CONTOURS SHALLOW OVERBURDEN APRIL 5, 2010

DRAWING NO.
16

SHEET 1 of 1



LEGEND

⊠ 752.06 MW-35(45)	Groundwater Elevation (feet) Monitoring Well ID and Screen Depth
**	Not Used for Contouring
—775—	Potentiometric Surface Contour (feet) (dashed where inferred)
W	Potable Water Well Location
783.20** ⊗ SG-2	Surface Water Elevation (feet) Staff Gage or Rail Gage Location
3618	Street Address
– – –	Approximate Property Boundary (from the Fulton County GIS website)

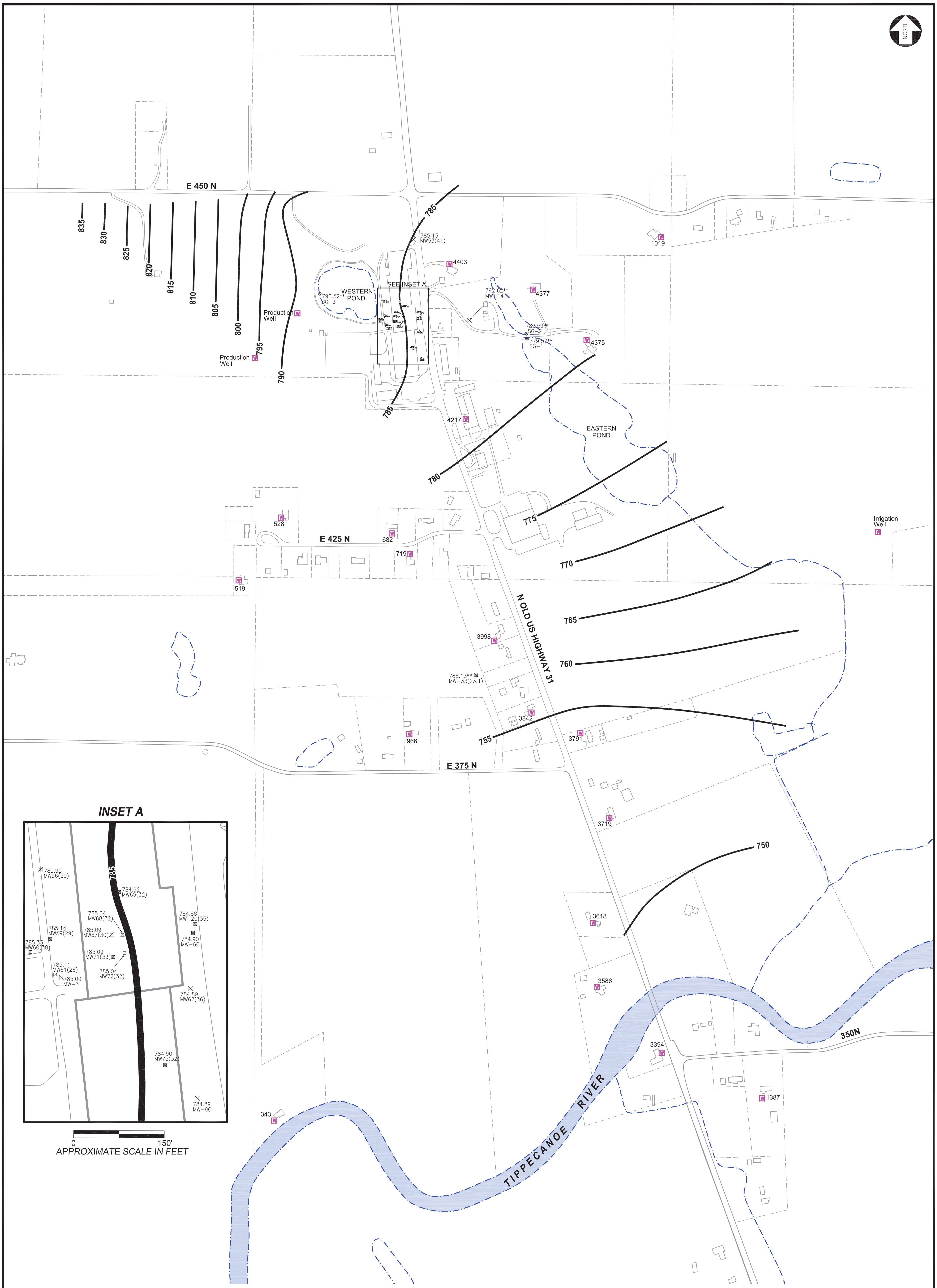
Note: Only shallow overburden monitoring wells are shown.

0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg APPROVED BY AMEC Electronic Signature DATE 08/12/2011 SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005. PROJECT NO. 3359 09 2469 SCALE SEE ABOVE	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	amec	**GROUNDWATER CONTOUR MAP** **SHALLOW OVERBURDEN WELLS** **DECEMBER 6, 2010**

DRAWING NO. **16**

SHEET 1 of 1



LEGEND

751.93 MW-35(45) — Groundwater Elevation (feet) Monitoring Well ID and Screen Depth

** — Not Used for Contouring

775 — Potentiometric Surface Contour (feet)

W — Potable Water Well Location

783.59** ⊗ SG-2 — Surface Water Elevation (feet) Staff Gage or Rail Gage Location

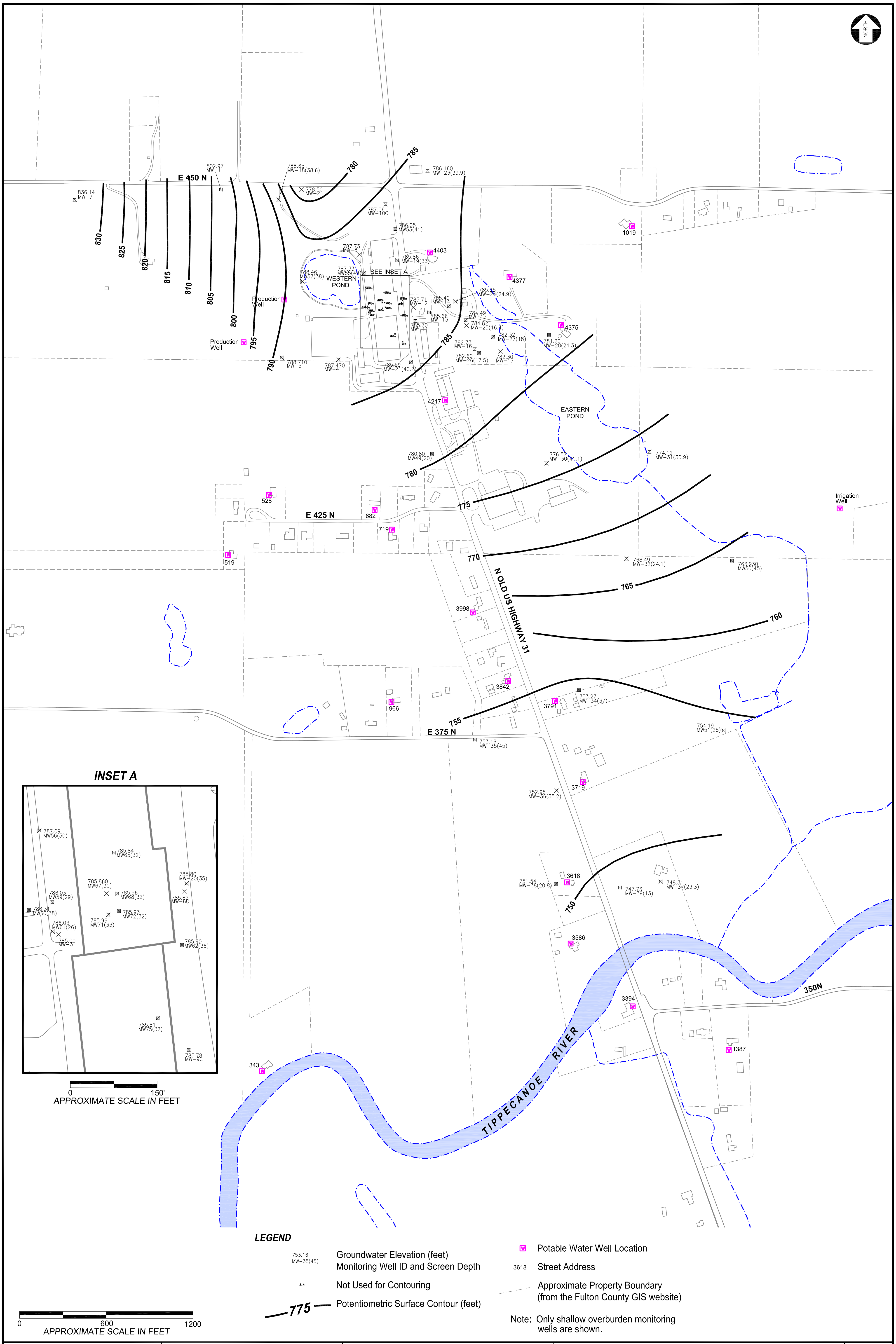
3618 — Street Address

Approximate Property Boundary (from the Fulton County GIS website)

Note: Only shallow overburden monitoring wells are shown.

0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg	TORX FACILITY 4366 NORTH OLD US HIGHWAY 31 ROCHESTER, INDIANA	amec	GROUNDWATER CONTOUR MAP SHALLOW OVERBURDEN WELLS SEPTEMBER 19, 2011
APPROVED BY	DATE 07/02/2012			DRAWING NO. 16
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.				SHEET 1 of 1
PROJECT NO. 3359 11 2583	SCALE SEE ABOVE			



DRAWN BY RLB	FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg
APPROVED BY	DATE 05/24/2012
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.	
PROJECT NO. 3359 11 2583	SCALE SEE ABOVE

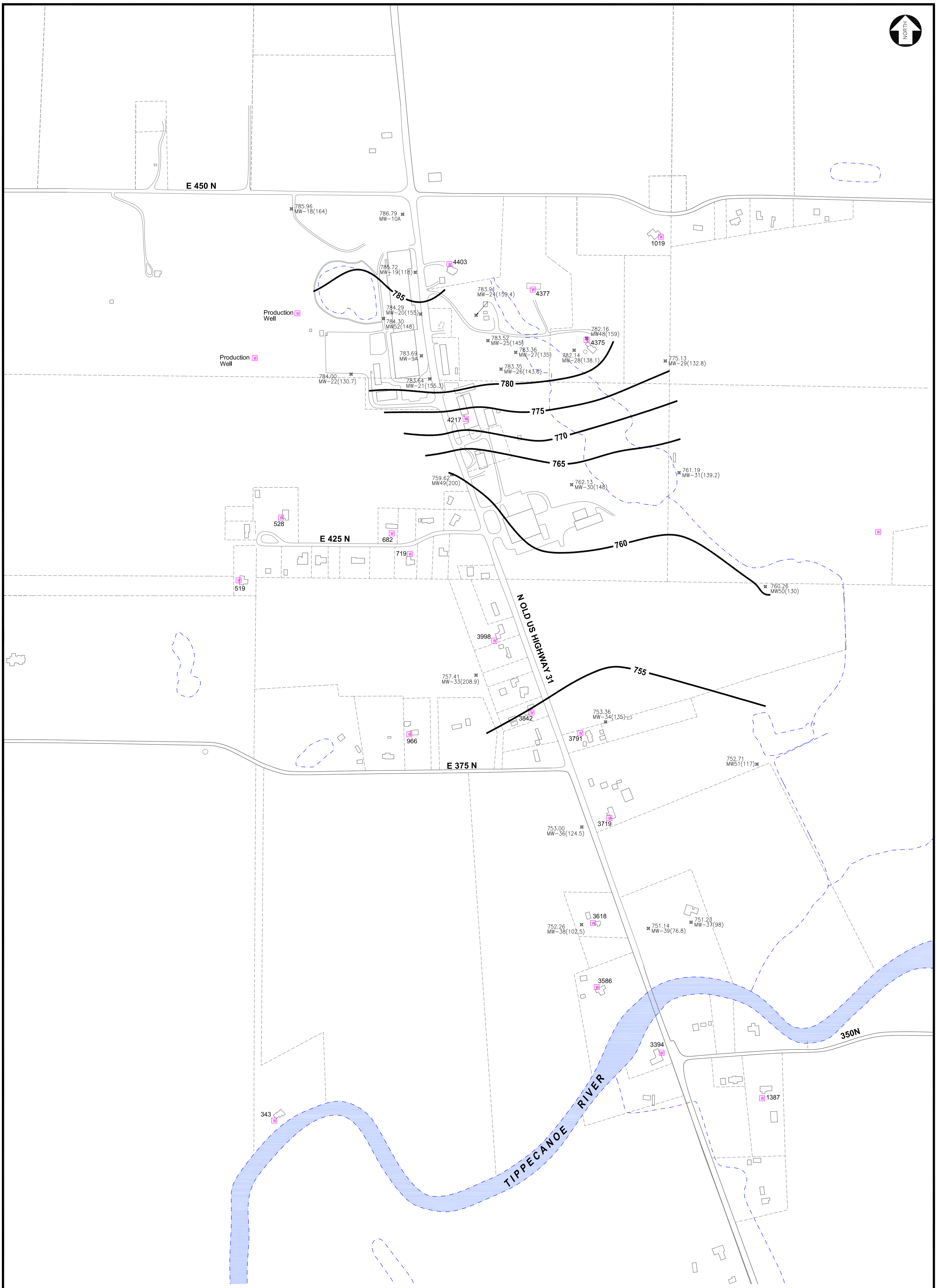
TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

GROUNDWATER CONTOUR MAP
SHALLOW OVERBURDEN WELLS
APRIL 9, 2012

DRAWING NO.
--

SHEET 1 of 1



LEGEND

753.36 MW-35(135)	Groundwater Elevation (feet AMSL) Monitoring Well ID and Screen Depth	W	Potable Water Well Location
**	Not Used for Contouring	3618	Street Address
—775—	Potentiometric Surface Contour (feet) (dashed where inferred)	– – –	Approximate Property Boundary (from the Fulton County GIS website)

0 600 1200
APPROXIMATE SCALE IN FEET

Note: Only deep overburden monitoring wells are shown.

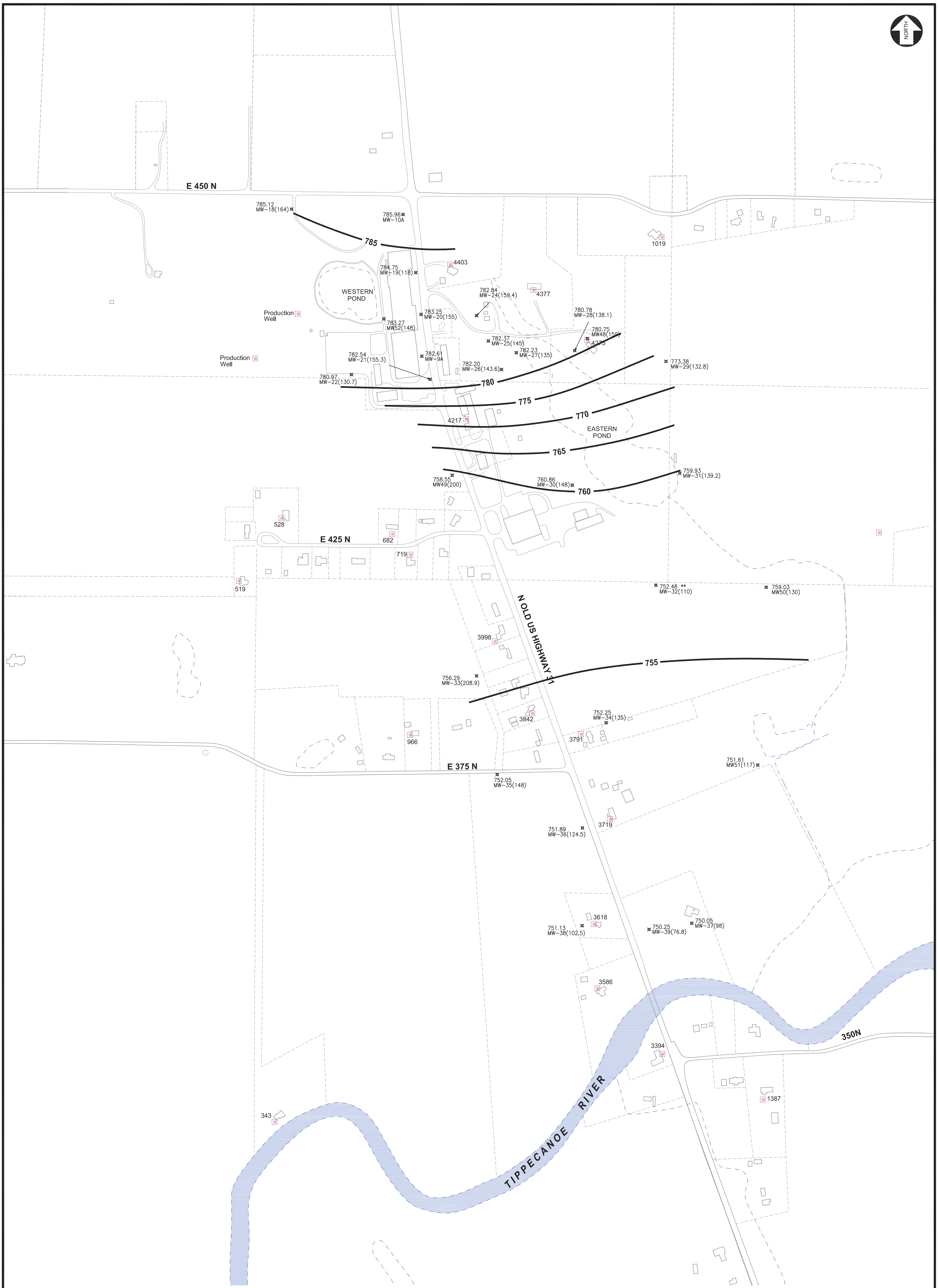
DRAWN BY	RLB
FILE NO.	P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg
APPROVED BY	
DATE	06/04/2010
SOURCE	Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.
PROJECT NO.	3359 09 2469
SCALE	SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

MACTEC
521 Byers Road Suite 204
Miamisburg, Ohio 45342
(937) 859-3600 FAX (937) 859-7951

POTENTIOMETRIC
SURFACE CONTOURS
DEEP OVERBURDEN
APRIL 5, 2010

DRAWING NO.
17
SHEET 1 of 1



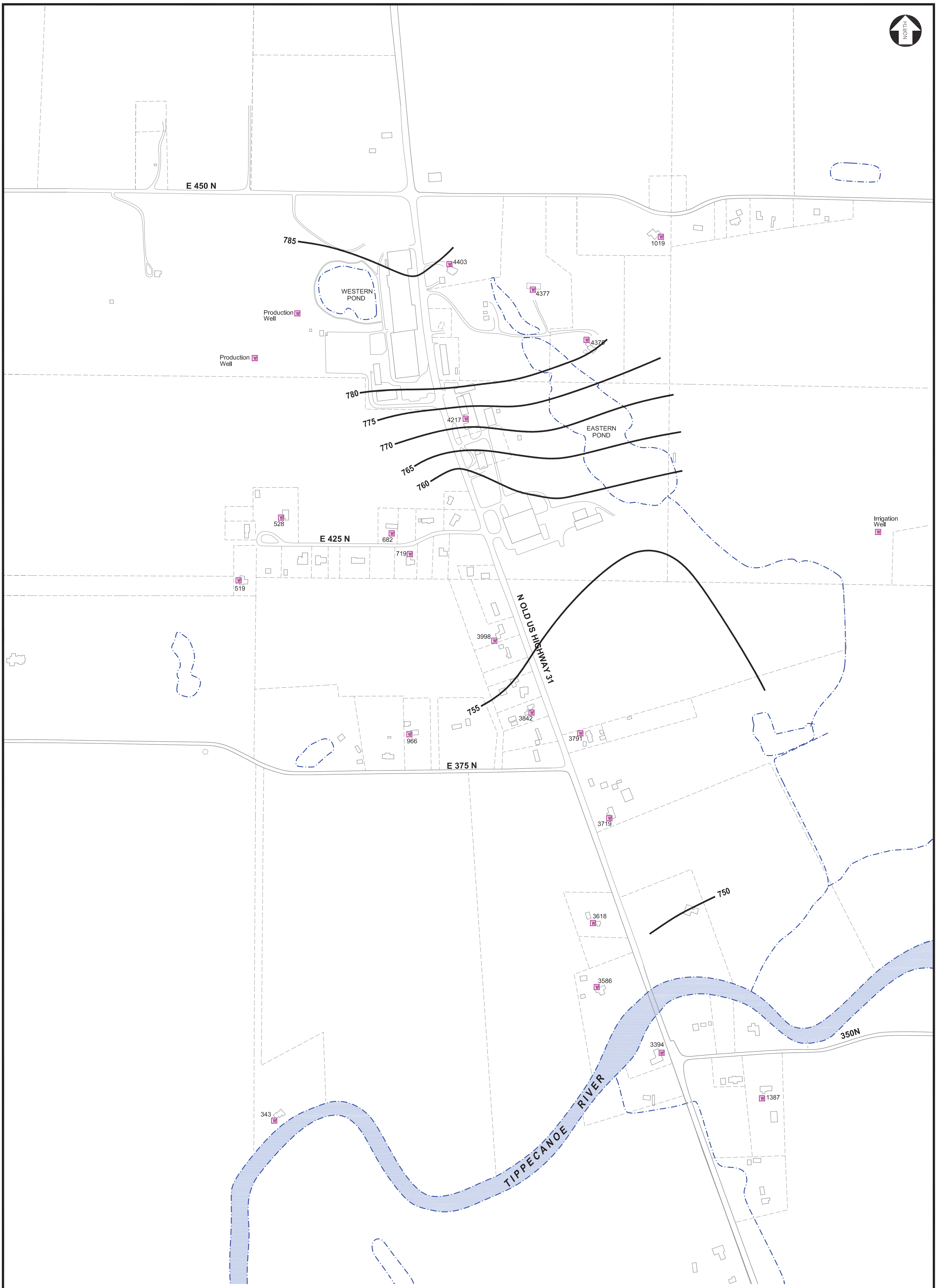
LEGEND

⌧ 750.05 MW–37(98)	Groundwater Elevation (feet) Monitoring Well ID and Screen Depth	W	Potable Water Well Location
**	Not Used for Contouring	3618	Street Address
775	Potentiometric Surface Contour (feet) (dashed where inferred)	– – –	Approximate Property Boundary (from the Fulton County GIS website)

Note: Only deep overburden monitoring
wells are shown.

0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY RLB FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg APPROVED BY AMEC Electronic Signature DATE 08/12/2011 SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005. PROJECT NO. 3359 09 2469 SCALE SEE ABOVE	**TORX FACILITY** **4366 NORTH OLD US HIGHWAY 31** **ROCHESTER, INDIANA**	amec	**GROUNDWATER CONTOUR MAP** **DEEP OVERBURDEN WELLS** **DECEMBER 6, 2010**	DRAWING NO. **17** SHEET 1 of 1



LEGEND

749.82 MW−37(98) Groundwater Elevation (feet)
Monitoring Well ID and Screen Depth

775 Potentiometric Surface Contour (feet)

Note: Only deep overburden monitoring wells are shown.

W Potable Water Well Location

3618 Street Address

Approximate Property Boundary (from the Fulton County GIS website)

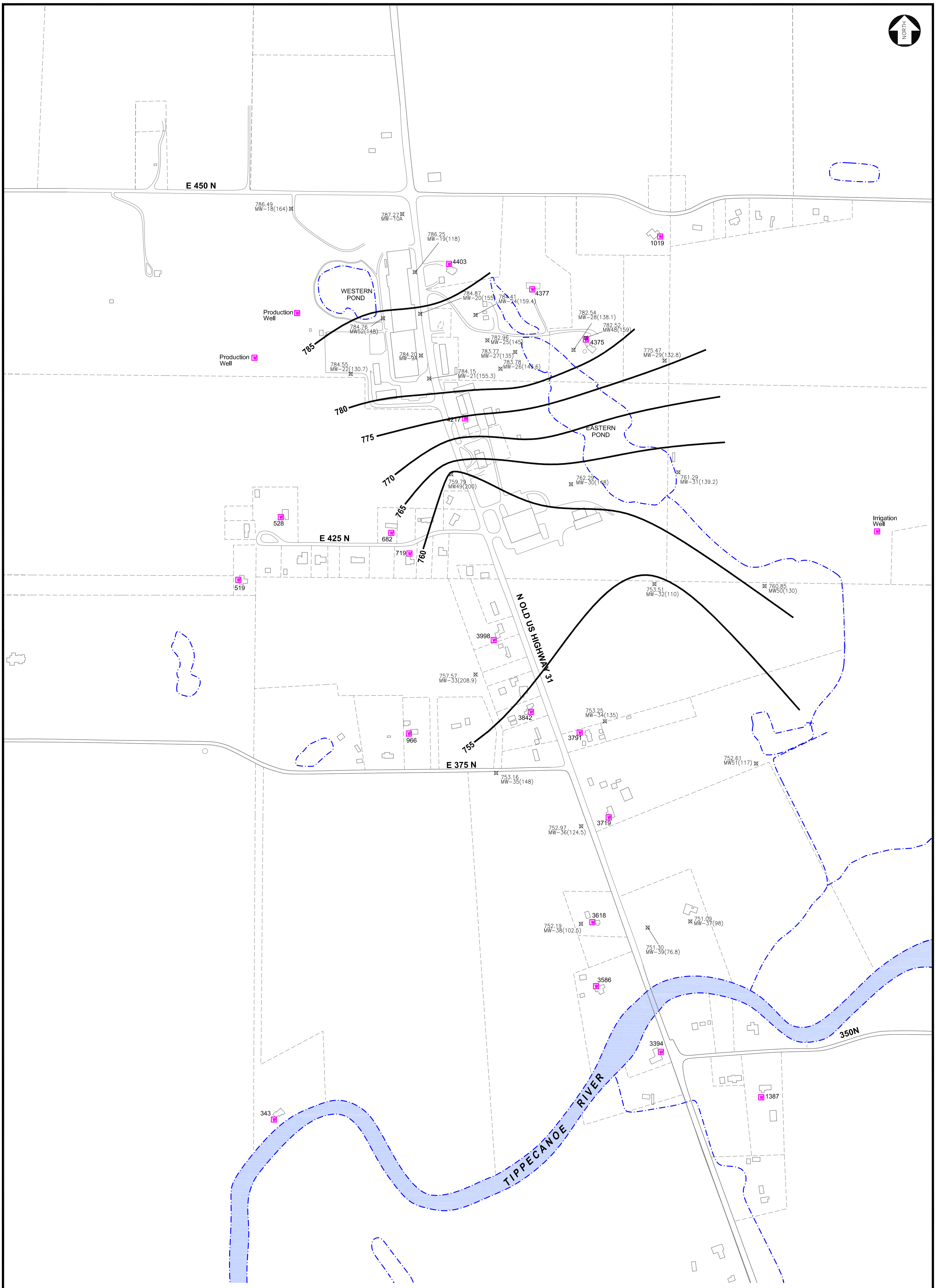
0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY
RLB
P:\Textron\TFS\Drawings\ FILE NO.
TFS PS Plan 2010 11x17.dwg
APPROVED BY
DATE
07/02/2012
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.
PROJECT NO.
3359 11 2583
SCALE
SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

GROUNDWATER CONTOUR MAP
DEEP OVERBURDEN WELLS
SEPTEMBER 19, 2011

DRAWING NO.
17
SHEET 1 of 1



LEGEND

751.09
MW-37(98) Groundwater Elevation (feet)
Monitoring Well ID and Screen Depth

775 Potentiometric Surface Contour (feet)

Note: Only deep overburden monitoring wells are shown.

W Potable Water Well Location

3618 Street Address

Approximate Property Boundary (from the Fulton County GIS website)

0 600 1200
APPROXIMATE SCALE IN FEET

DRAWN BY RLB
FILE NO. P:\Textron\TFS\Drawings\TFS PS Plan 2010 11x17.dwg
APPROVED BY
DATE 05/24/2012
SOURCE Wells surveyed by Territorial Engineering, 2009 & 2010; Fulton County, IN GIS, 2005.
PROJECT NO. 3359 11 2583
SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

GROUNDWATER CONTOUR MAP
DEEP OVERBURDEN WELLS
APRIL 9, 2012

DRAWING NO. --
SHEET 1 of 1

APPENDIX D

SUMMARY OF PROPERTIES WITH MUNICIPAL WATER SUPPLY

SUMMARY OF ENVIRONMENTAL RESTRICTIVE COVENANTS ON THE SURROUNDING PROPERTIES

Appendix D
Municipal Water Service Provided to Surrounding Properties

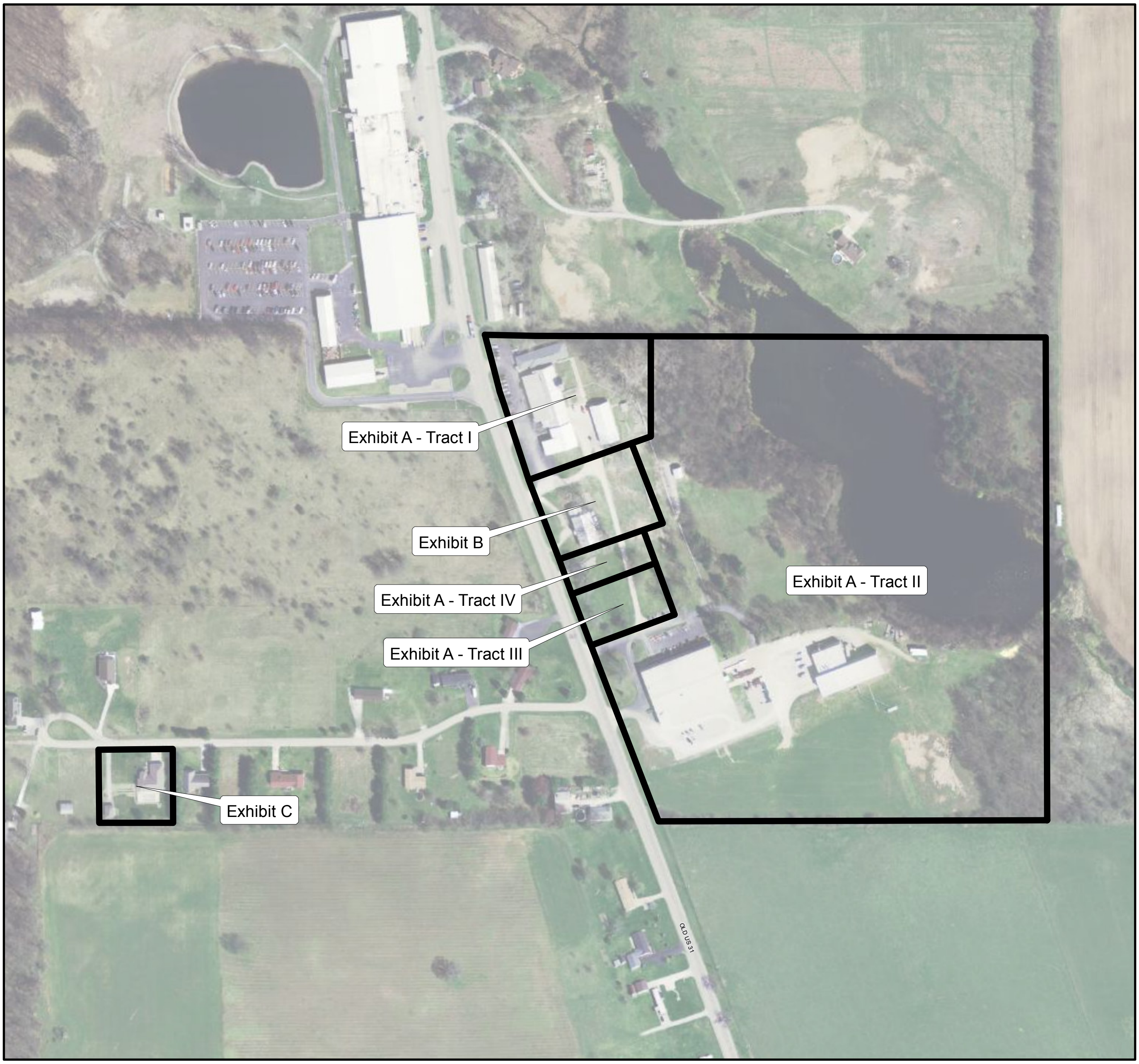
STREET ADDRESS	PARCEL ID
3796 N Old US Highway 31	008-120007-00
1082 E 375 N	008-102028-00
4008 N Old US Highway 31	008-103008-00
3586 N Old US Highway 31	008-116008-00 008-116008-01
781 E 425 N	008-119011-50 008-118037-01
966 E 375 N	008-104007-10
682 E 425 N	008-118037-00 008-118036-00
4079 N Old US Highway 31	008-120003-76 008-102069-00 008-101000-00
557 E 425 N	008-101003-30
528 E 425 N	008-123000-00
948 E 375 N	008-108030-51
3719 N Old US Highway 31	008-108033-00 008-108040-01
1387 E 350 N	009-111045-00
4163 N Old US Highway 31	008-119007-00
581 E 425 N	008-104020-00 008-118037-03
3980 N Old US Highway 31	008-127014-00
972 E 375N	008-115000-00
3998 N Old US Highway 31	008-110204-00 008-127010-00
3791 N Old US Highway 31	008-108040-00
4403 N Old US Highway 31	008-107025-00
3868 N Old US Highway 31	008-114007-00 008-114008-00
3618 N Old US Highway 31	008-116007-00
3597 N Old US Highway 31	008-116020-01 008-116020-00
519 E 425 N	008-118011-50
908 E 375 N	008-118033-00
782 E 425 N	008-104010-00
3842 N Old US Highway 31	008-120010-00
501 E 425 N	008-118135-00 008-118035-01
750 E 425 N	008-123024-50
4366 N Old US Highway 31	008-120003-66
4016 N Old US Hwy 31	008-126002-00
719 E 425 N	008-104009-50
537 E 425 N	008-101000-00

Appendix D
Environmental Restrictive Covenants on Surrounding Properties

STREET ADDRESS	PARCEL ID
4403 N Old US Highway 31	008-107025-00
4217 / 4133 / 4079 N Old US Highway 31	008-120003-76 008-102069-00
4163 N Old US Highway 31	008-119007-00
4016 N Old US Highway 31	008-126002-00
4008 N Old US Highway 31	008-103008-00
3998 N Old US Highway 31	008-110204-00 008-127010-00
3980 N Old US Highway 31	008-127014-00
3868 N Old US Highway 31	008-114007-00 008-114008-00
3842 N Old US Highway 31	008-120010-00
3796 N Old US Highway 31	008-120007-00
3791 N Old US Highway 31	008-108040-00
3719 N Old US Highway 31	008-108033-00 008-108040-01
3618 N Old US Highway 31	008-116007-00
3597 N Old US Highway 31	008-116020-01 008-116020-00
3586 N Old US Highway 31	008-116008-00 008-116008-01
782 E 425 N	008-104010-00
781 E 425 N	008-119011-50 008-118037-01
750 E 425 N	008-123024-50
682 E 425 N	008-118037-00 008-118036-00
581 E 425 N	008-104020-00 008-118037-03
557 E 425 N	008-101003-30
537 E 425 N	008-101000-00
528 E 425 N	008-123000-00
519 E 425 N	008-118011-50
501 E 425 N	008-118135-00 008-118035-01
1082 E 375 N	008-102028-00
972 E 375 N	008-115000-00
966 E 375 N	008-104007-10
948 E 375 N	008-108030-51
908 E 375 N	008-118033-00
1387 E 350 N	009-111045-00

Prepared By: WDG
Checked By: PJS

IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
4217 N Old US 31, 4133 N Old US 31, 537 E 425 N, Rochester, IN



Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 16, 2012		
Fulton County Deed Info:	-Instrument # 0001243, Recorded April 7, 2000 -Instrument # 200700702677, Recorded August 27, 2007 -Instrument # 201001000840, Recorded April 2, 2010		
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)		
State Parcel #:	25-03-98-400-006.000-007 25-03-98-400-007.010-007 25-03-98-300-002.012-007		
Property Key:	008-102069-00	008-120003-76	008-101000-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN		
Property Address:	4217 N Old US 31 Rochester, IN	4133 N Old US 31	537 E 425 N
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.		

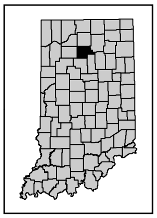
▭ Environmental Restrictive Covenant

IDEM

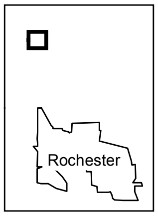
0 250 500 Feet

0 50 100 Meters

Fulton County



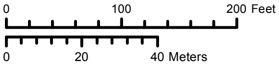
Project Area



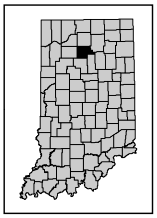
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
4163 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 4, 2012
Fulton County Deed Info:	-Deed Record 168, Page 549, Recorded February 12, 1993
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-400-004.000-007
Property Key:	008-119007-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	4163 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

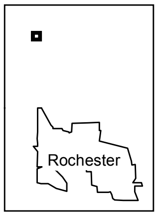
▭ Environmental Restrictive Covenant



Fulton County



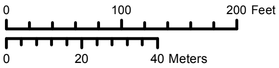
Project Area



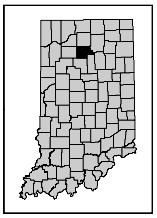
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
4016 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 22, 2012
Fulton County Deed Info:	-Instrument # 01011373, Recorded April 24, 2001
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-400-010.000-007
Property Key:	008-126002-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	4016 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

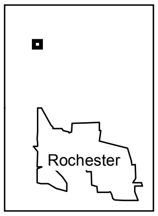
▭ Environmental Restrictive Covenant



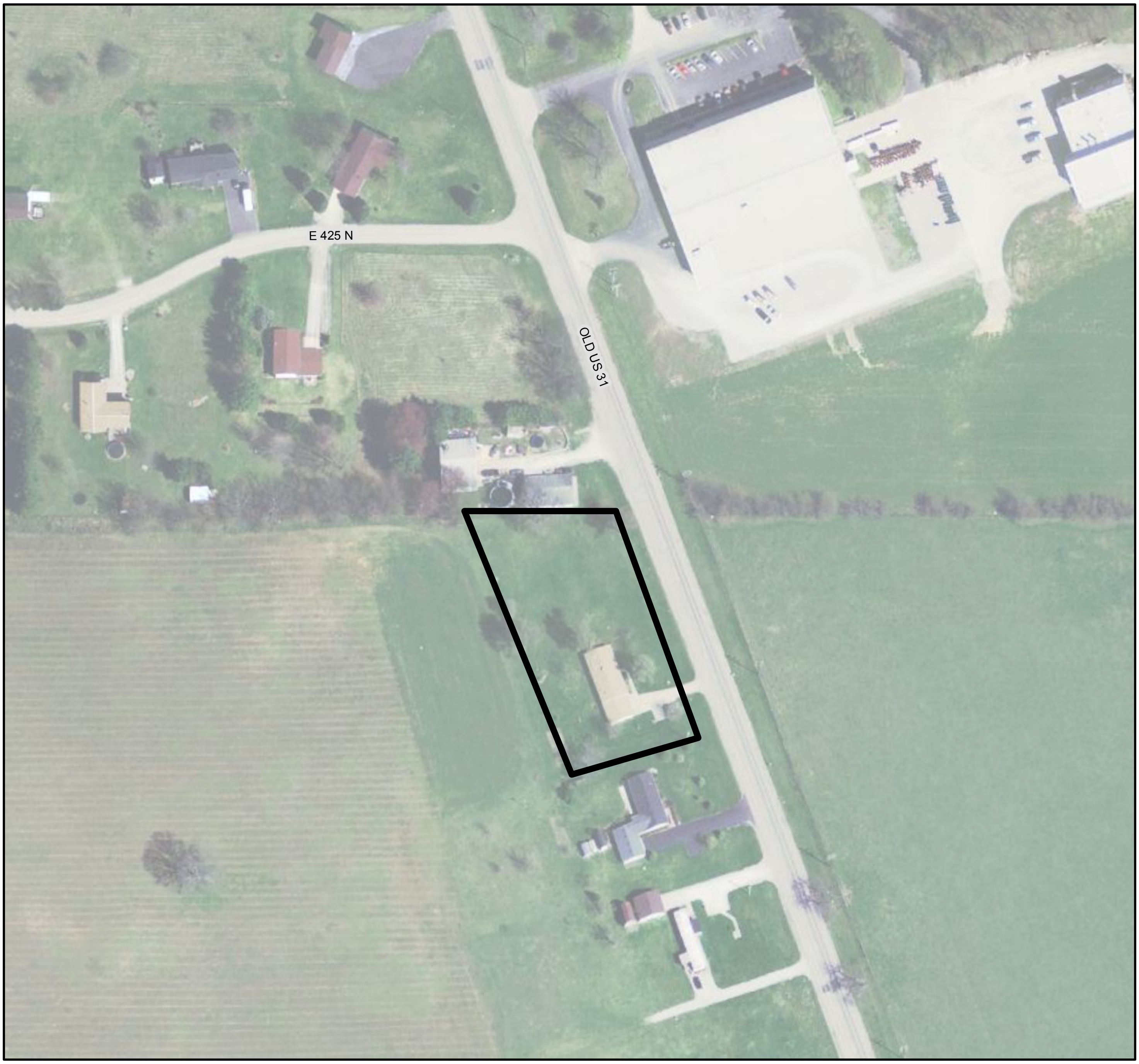
Fulton County



Project Area

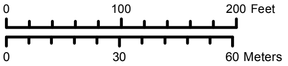


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
4008 N Old US 31, Rochester, IN

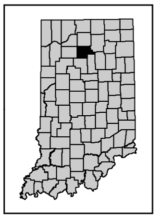


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 1, 2012
Fulton County Deed Info:	Deed Record Book 137, Page 62, Recorded May 21, 1974
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-002.000-007
Property Key:	008-103008-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	4008 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

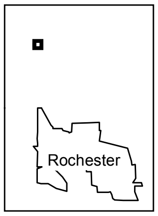
▭ Environmental Restrictive Covenant



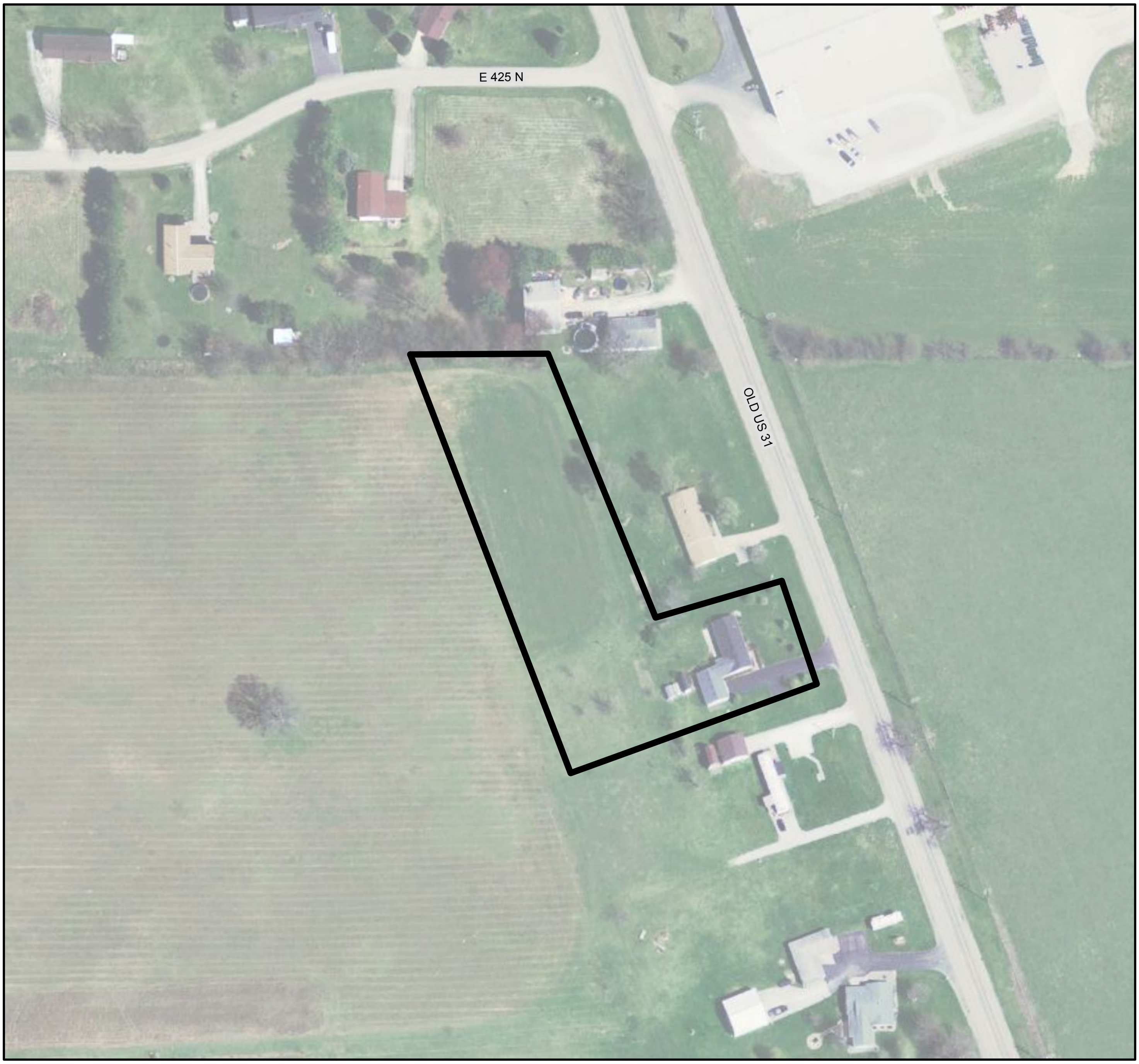
Fulton County



Project Area

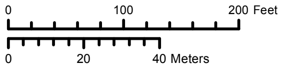


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3998 N Old US 31, Rochester, IN

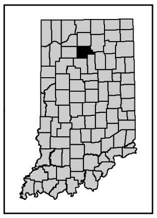


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 10, 2012
Fulton County Deed Info:	Instrument # 0404872, Recorded December 2, 2004
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.017-007
Property Key:	008-110204-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3998 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

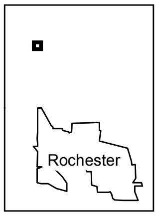
▭ Environmental Restrictive Covenant



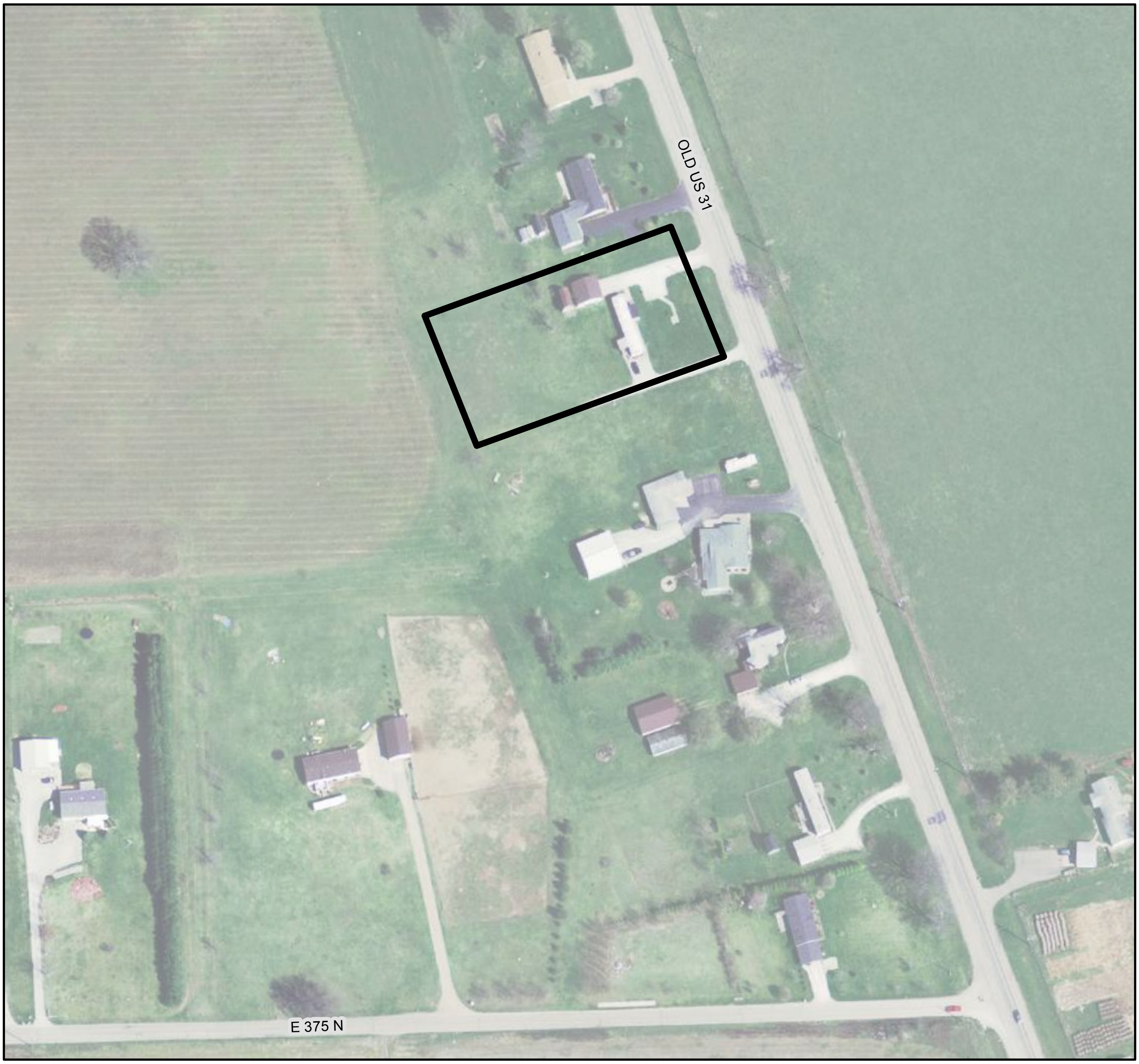
Fulton County



Project Area

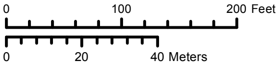


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3980 N Old US 31, Rochester, IN

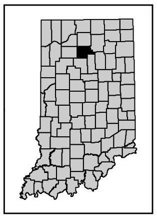


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 10, 2012
Fulton County Deed Info:	-Instrument # 9904946, Recorded November 3, 1999
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.016-007
Property Key:	008-127014-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3980 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

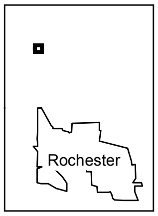
▭ Environmental Restrictive Covenant



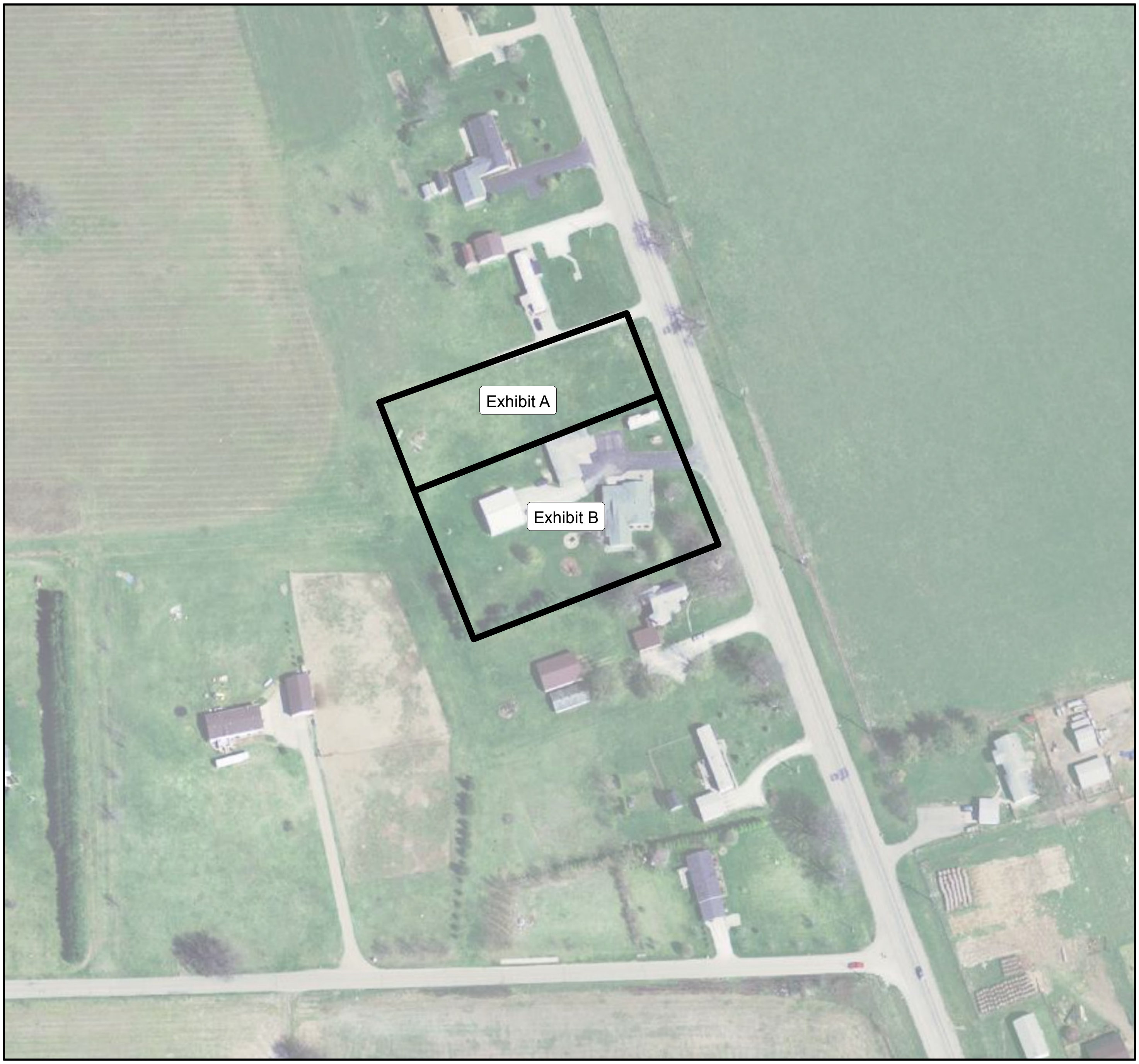
Fulton County



Project Area

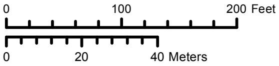


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3868 N Old US 31, Rochester, IN

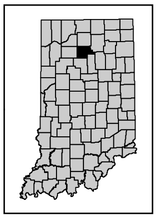


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 15, 2012
Fulton County Deed Info:	-Deed Record Book171, Page 508, Recorded August 15, 1994 (0.68 acres) -Deed Record Book141, Page 192, Recorded April 19, 1976 (1.22 acres)
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.014-007 25-03-99-100-004.000-007
Property Key:	008-114007-00 008-114008-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3868 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

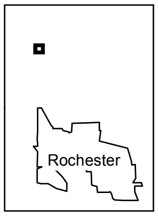
▭ Environmental Restrictive Covenant



Fulton County



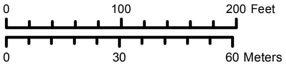
Project Area



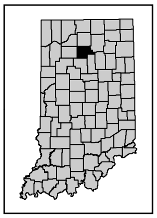
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3842 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 18, 2012
Fulton County Deed Info:	Deed Record Book 135, Page 563, Recorded October 2, 1973
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-005.000-007
Property Key:	008-120010-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3842 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

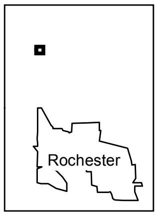
▭ Environmental Restrictive Covenant



Fulton County



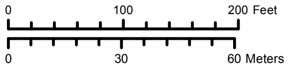
Project Area



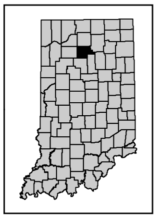
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3796 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 1, 2012
Fulton County Deed Info:	Deed Record Book 171, Page 539, Recorded August 24, 1994
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.013-007
Property Key:	008-120007-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3796 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

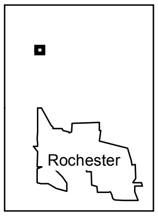
▭ Environmental Restrictive Covenant



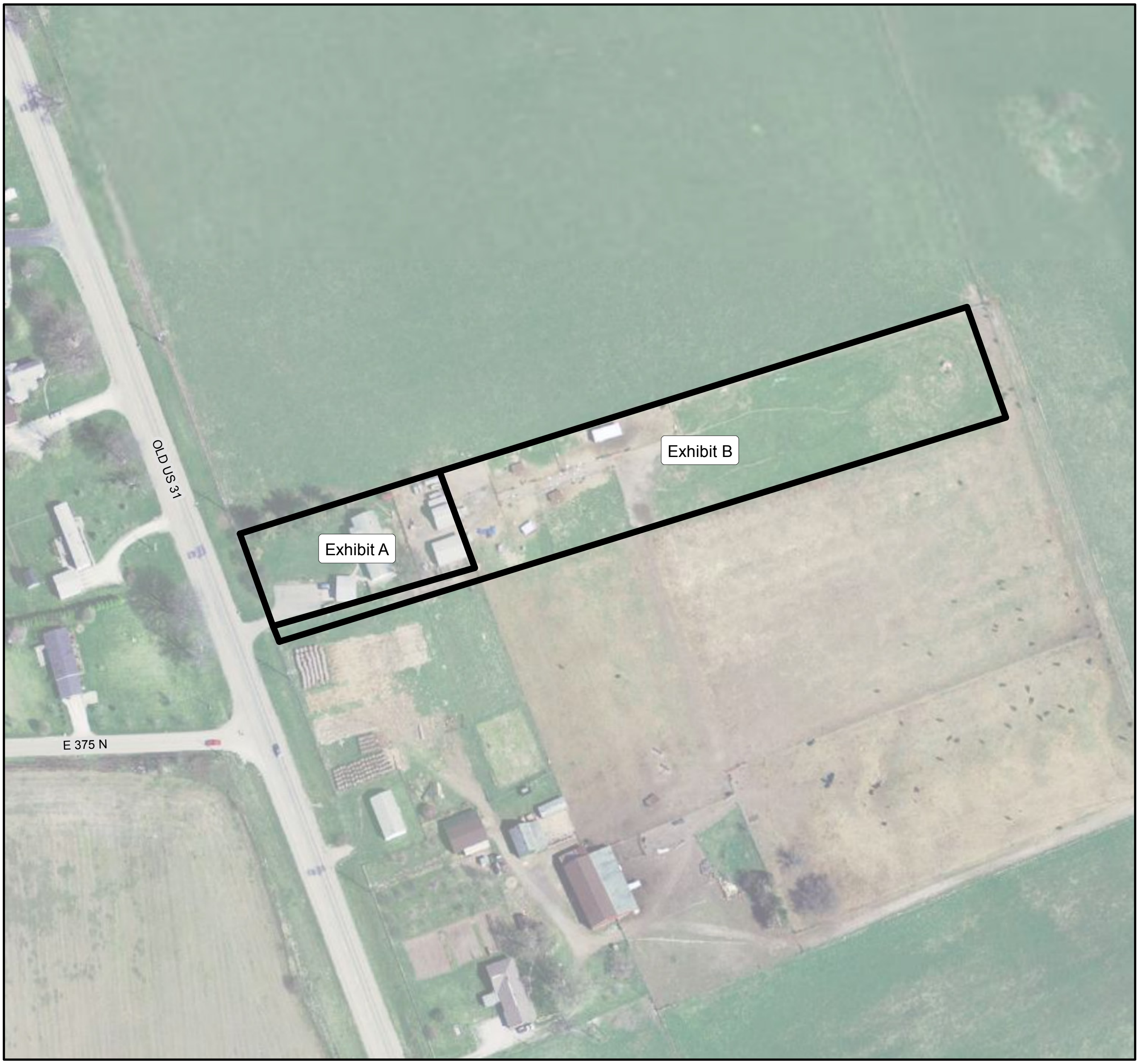
Fulton County



Project Area

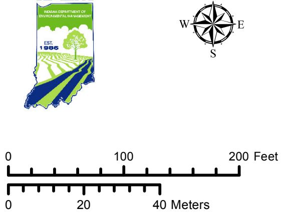


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3791 N Old US 31, Rochester, IN

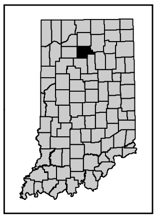


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 15, 2012
Fulton County Deed Info:	-Deed Record Book166, Page 137, Recorded August 26, 1991 (0.62 acres) -Instrument # 9904759, Recorded October 22, 1999 (1.90 acres)
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-200-001.013-007 25-03-99-200-001.014-007
Property Key:	008-108040-00 008-108052-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3791 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

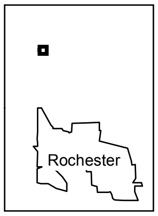
▭ Environmental Restrictive Covenant



Fulton County



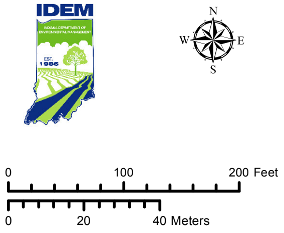
Project Area

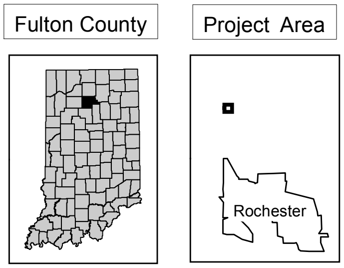


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3618 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 15, 2012
Fulton County Deed Info:	-Instrument # 0303839, Recorded July 31, 2003
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-010.000-007
Property Key:	008-116007-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3618 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

▭ Environmental Restrictive Covenant

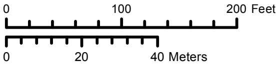




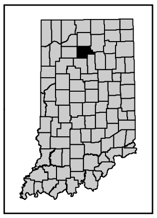
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3597 N Old US 31, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 15, 2012
Fulton County Deed Info:	-Deed Record Book 165, Page 529, Recorded June 25, 1991
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-200-001.012-007
Property Key:	008-116020-01
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3597 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

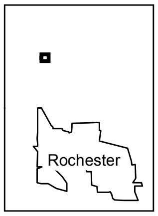
▭ Environmental Restrictive Covenant



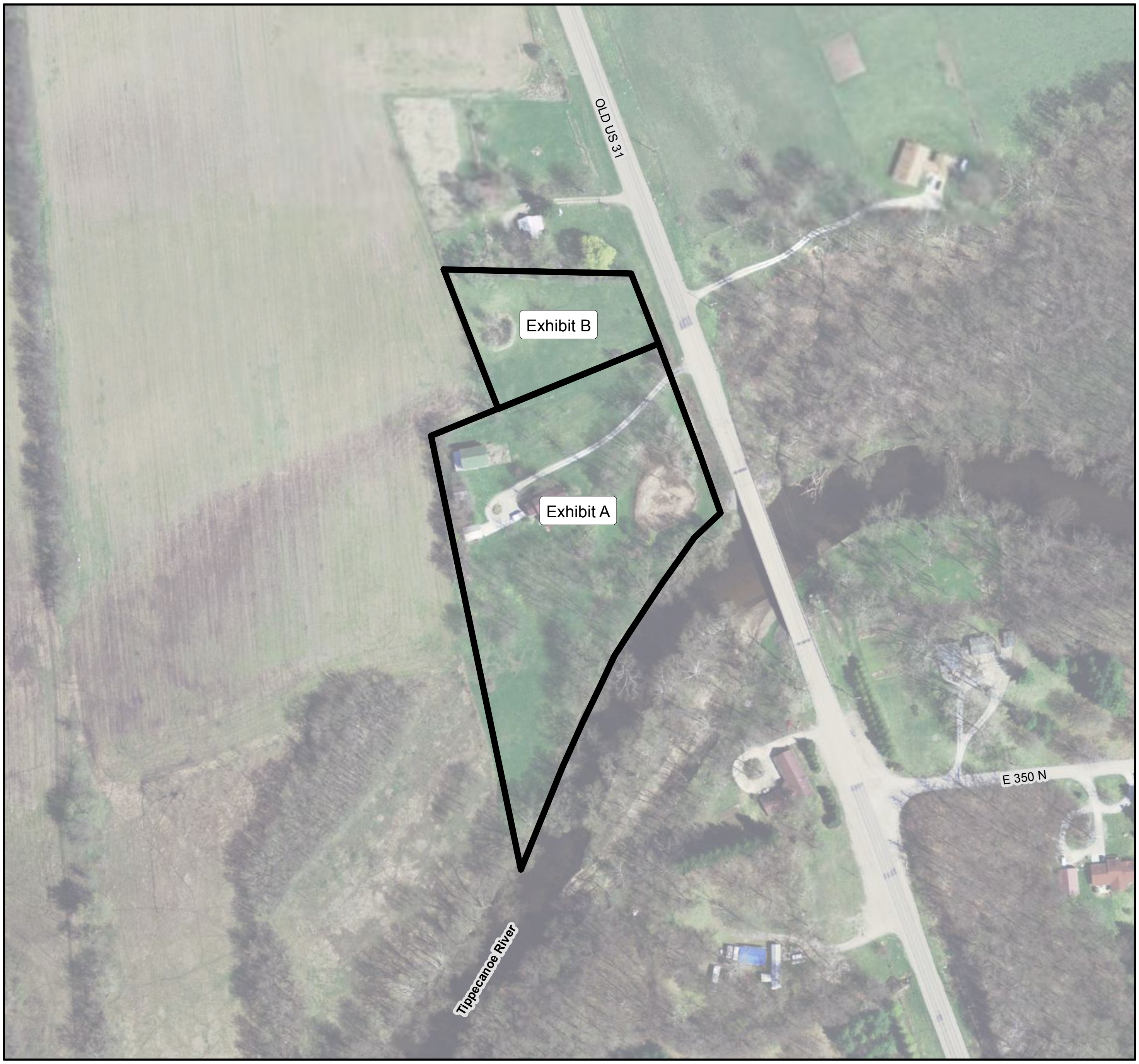
Fulton County



Project Area



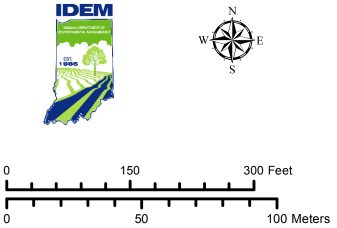
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
3586 N Old US 31, Rochester, IN



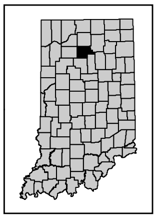
Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 2, 2012
Fulton County Deed Info:	-Instrument # 0103125, Recorded August 14, 2001 (4.25 acres) -Instrument # 0205700, Recorded December 2, 2002 (1.10 acres)
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #s:	25-03-99-100-009.030-007 25-03-99-100-009.020-007
Property Keys:	008-116008-00 008-116008-01
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	3586 N Old US 31 Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

▭ Environmental Restrictive Covenant

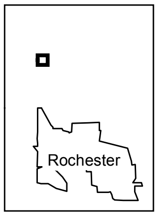
IDEM



Fulton County



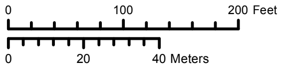
Project Area



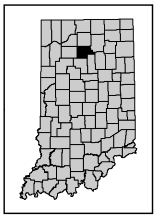
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
782 E 425 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 22, 2012
Fulton County Deed Info:	-Deed Record Book 171, Page 253, Recorded June 6, 1994 -Deed Record Book 173, Page 342, Recorded June 28, 1995
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-471-003.000-007 25-03-98-300-002.013-007
Property Key:	008-104010-00 008-118034-01
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	782 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

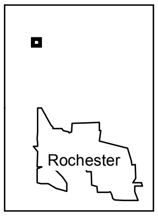
▭ Environmental Restrictive Covenant



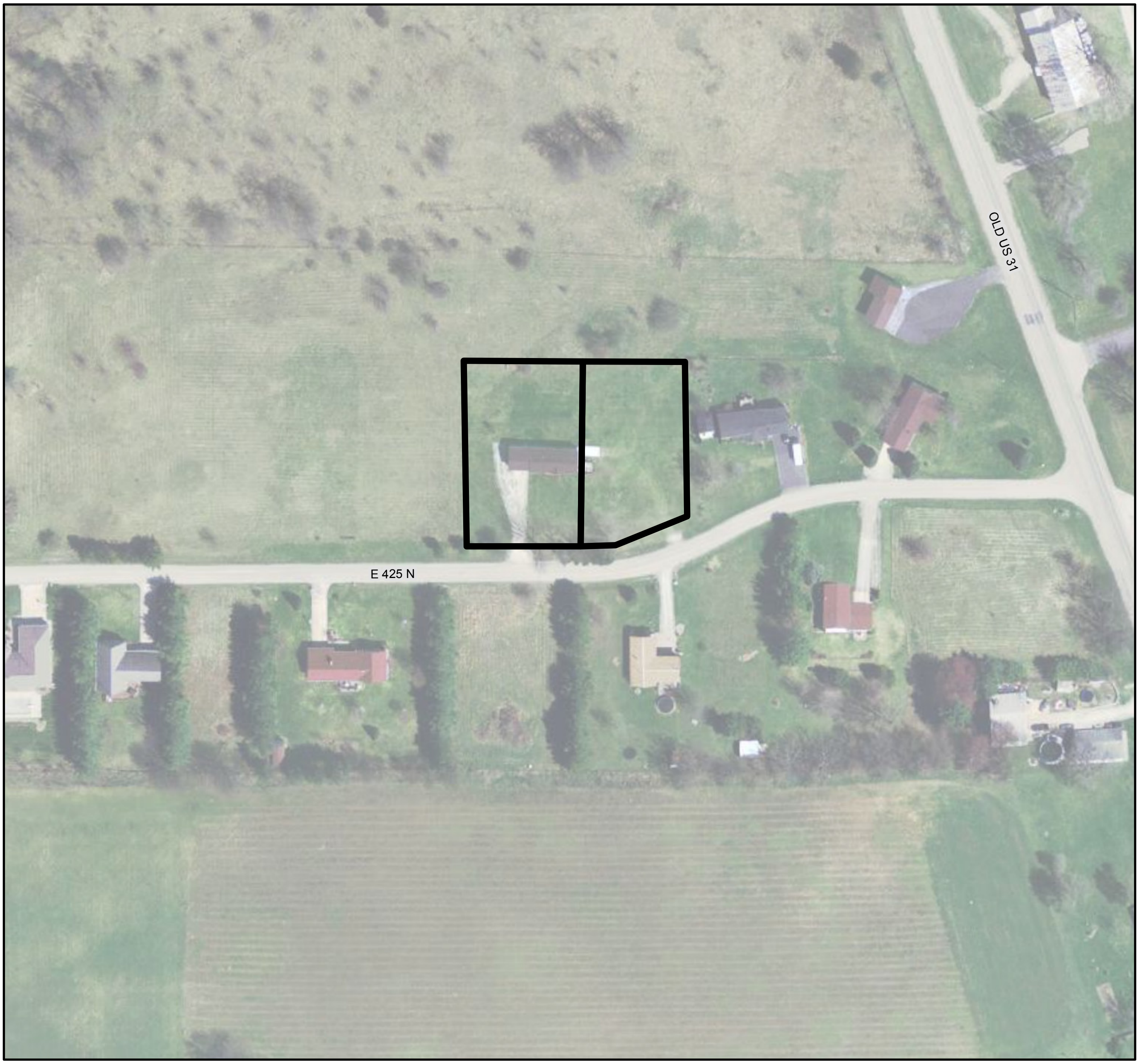
Fulton County



Project Area



IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
682 E 425 N, Rochester, IN



Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 2, 2012
Fulton County Deed Info:	Instrument # 9901999, Recorded May 3, 1999
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #s:	25-03-98-471-001.000-007 25-03-98-300-002.016-007
Property Keys:	008-118037-00 008-118036-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	682 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

▭ Environmental Restrictive Covenant

N
W E
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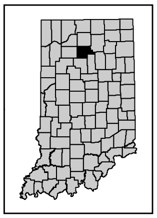
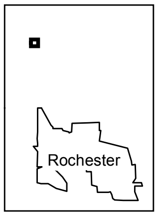
0 100 200 Feet
0 20 40 Meters

Fulton County



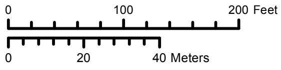
Project Area



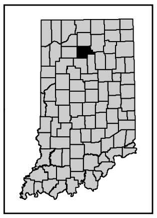
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
537 E 425 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 15, 2012
Fulton County Deed Info:	Instrument # 201001000840, Recorded April 2, 2010
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-300-002.012-007
Property Key:	008-101000-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	537 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

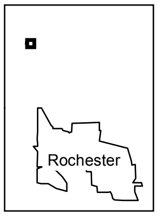
▭ Environmental Restrictive Covenant



Fulton County



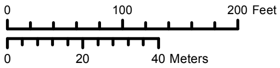
Project Area



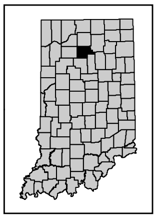
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
528 E 425 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 3, 2012
Fulton County Deed Info:	Instrument # 0100327, Recorded January 31, 2001
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-300-002.015-007
Property Key:	008-123000-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	528 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

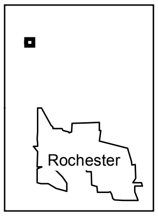
▭ Environmental Restrictive Covenant



Fulton County



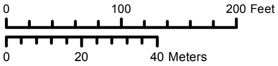
Project Area



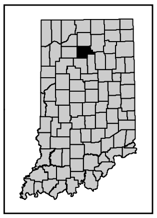
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
519 E 425 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 17, 2012
Fulton County Deed Info:	Deed Record Book 147, Page 43, Recorded April 24, 1979
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-300-003.000-007
Property Key:	008-118011-50
PLSS Info:	Section 19, T31N, R3E Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	519 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

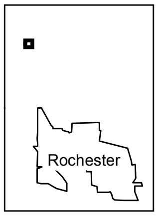
▭ Environmental Restrictive Covenant



Fulton County



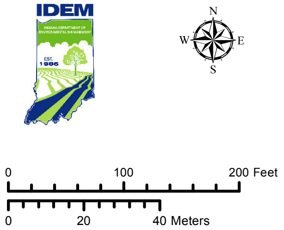
Project Area



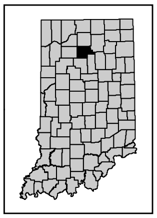
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
501 E 425 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 22, 2012
Fulton County Deed Info:	-Instrument # 9649850, Recorded November 18, 1996 -Instrument # 0304735, Recorded September 12, 2003
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-98-300-002.014-007 25-03-98-300-002.017-007
Property Key:	008-118035-01 008-118135-00
PLSS Info:	Section 28, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	501 E 425 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

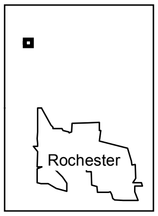
▭ Environmental Restrictive Covenant



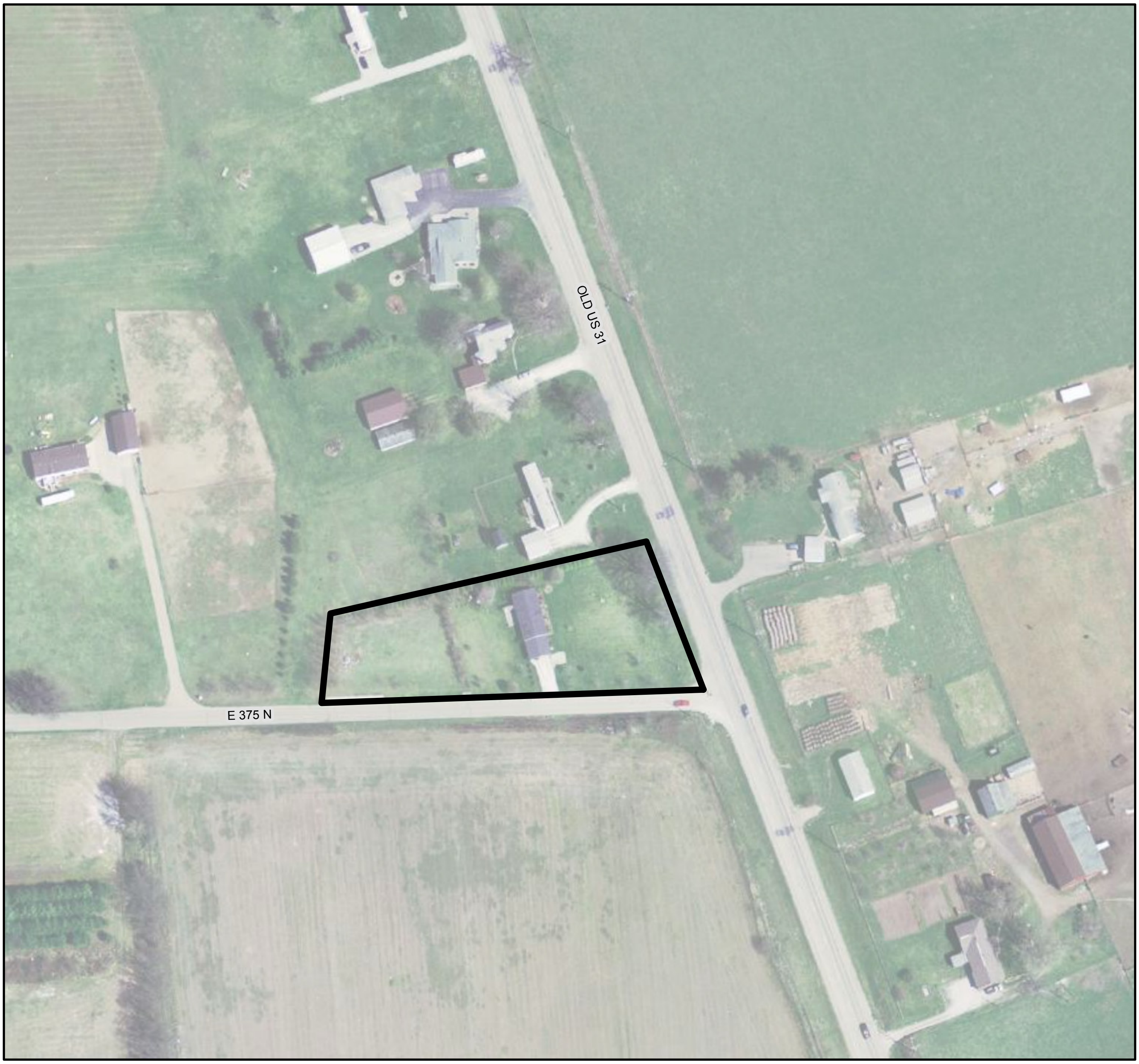
Fulton County



Project Area

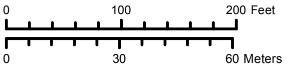


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
1082 E 375 N, Rochester, IN

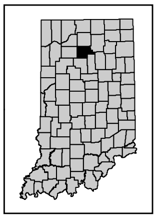


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 1, 2012
Fulton County Deed Info:	Deed Record Book 171, Page 503, Recorded August 12, 1994
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.015-007
Property Key:	008-102028-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	1082 E 375 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

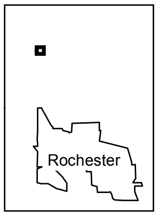
▭ Environmental Restrictive Covenant



Fulton County



Project Area



IDEM State Cleanup # 7100149 - Environmental Restrictive Covenants Related to Textron Facility, Rochester, IN (1082 E 375 N)

Mapped By: Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 23, 2012

PLSS Info:
Section 19, T31N, R3E
Sections 28 & 29, Michigan Road Land Sections
Richland & Rochester Townships
Fulton County, IN

Aerial Info: 2005 Statewide Orthophotography (1 foot resolution)

Disclaimer: This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

1082 E 375 N Info:

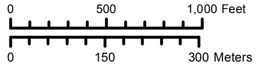
Fulton County Deed Info: Deed Record Book 171, Page 503, Recorded August 12, 1994

State Parcel #: 25-03-99-100-001.015-007

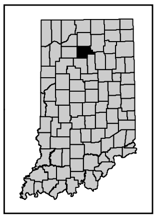
Property Key: 008-102028-00

Property Address: 1082 E 375 N, Rochester, IN

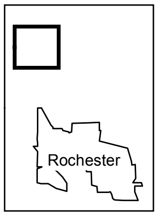
■ ERC - 1082 E 375 N
☐ Environmental Restrictive Covenant (ERC)



Fulton County



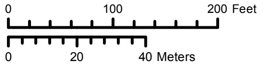
Project Area



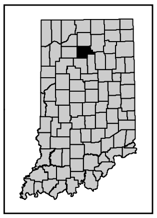
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
972 E 375 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 10, 2012
Fulton County Deed Info:	Instrument # 200800802643, Recorded October 3, 2008
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.012-007
Property Key:	008-115000-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	972 E 375 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

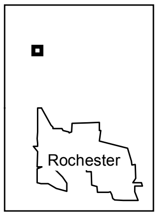
▭ Environmental Restrictive Covenant



Fulton County



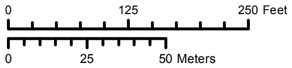
Project Area



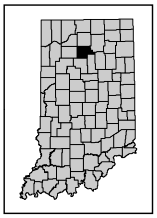
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
966 E 375 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 2, 2012
Fulton County Deed Info:	Instrument # 0305755, Recorded November 7, 2003
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-001.011-007
Property Key:	008-104007-10
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	966 E 375 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

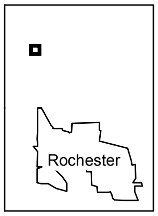
▭ Environmental Restrictive Covenant



Fulton County



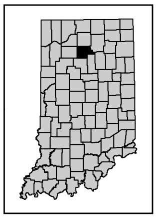
Project Area



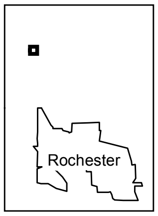
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
948 E 375 N, Rochester, IN

▭ Environmental Restrictive Covenant

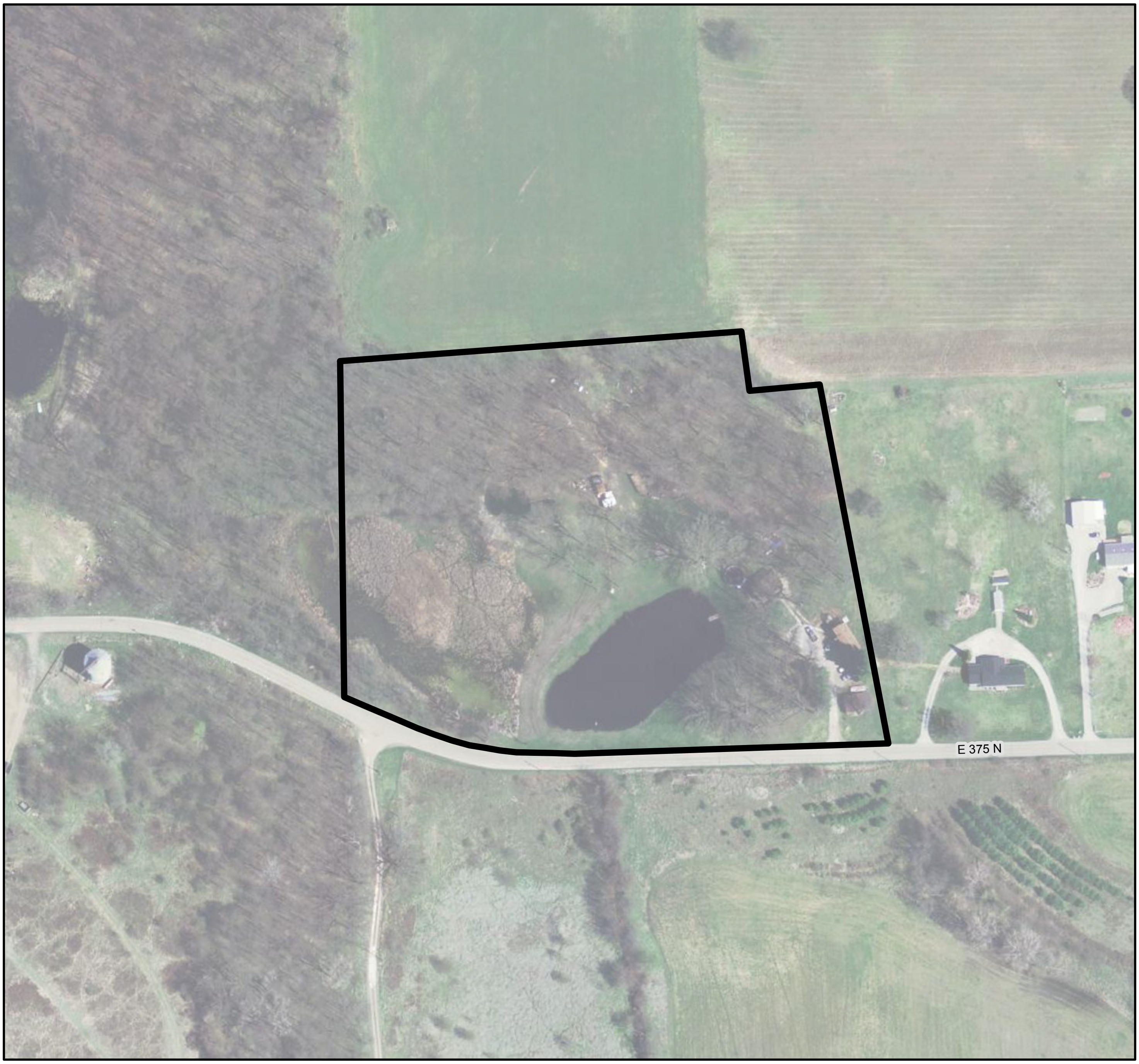
Fulton County



Project Area

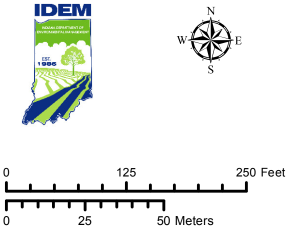


IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
908 E 375 N, Rochester, IN

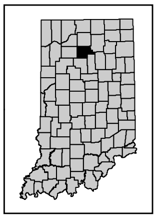


Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 17, 2012
Fulton County Deed Info:	Deed Record Book 169, Page 546, Recorded September 2, 1993
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-100-003.000-007
Property Key:	008-118033-00
PLSS Info:	Section 29, Michigan Road Land Sections Richland Township Fulton County, IN
Property Address:	908 E 375 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

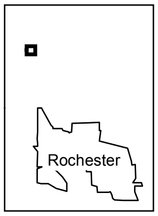
▭ Environmental Restrictive Covenant



Fulton County



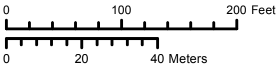
Project Area



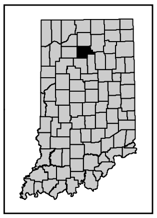
IDEM State Cleanup # 7100149 - Environmental Restrictive Covenant
1387 E 350 N, Rochester, IN

Mapped By:	Mike Hill, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, October 3, 2012
Fulton County Deed Info:	Instrument # 9901708, Recorded April 15, 1999
Aerial Info:	2005 Statewide Orthophotography (1 foot resolution)
State Parcel #:	25-03-99-400-004.012-008
Property Key:	009-111045-00
PLSS Info:	Section 29, Michigan Road Land Sections Rochester Township Fulton County, IN
Property Address:	1387 E 350 N Rochester, IN
Disclaimer:	This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

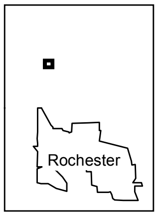
▭ Environmental Restrictive Covenant



Fulton County



Project Area



APPENDIX E

SOIL BORING LOGS AND WELL COMPLETION DIAGRAMS

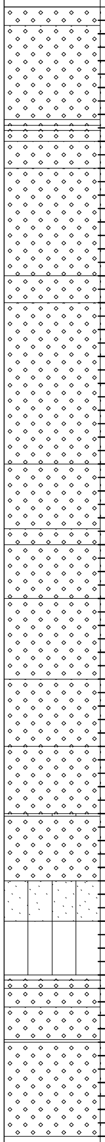
CLIENT:	**Textron**	NORTHING:	**2138615.45**
PROJECT NAME:	**TORX Facility**	EASTING:	**173732.94**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.76**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.28**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**42**
DATE DRILLED:	**10/17/12**		

B76 / MW76

Soil Sampling Data

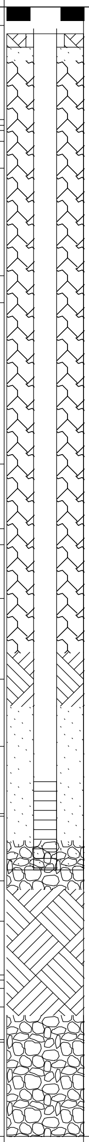
SHEET **1** OF **1**

STRATA



DEPTH FEET	DESCRIPTION
	Concrete
	SAND, fine, trace gravel, trace cobble, dry, light brown.
	SAND, fine, trace clay, moist, brown
	SAND, fine, trace gravel, trace cobble, dry, light brown.
	SAND, fine, trace clay, moist, brown.
	SAND, fine, trace gravel, trace cobble, dry, light brown.
10	SAND, fine, moist, light brown.
	SAND, fine to coarse, some gravel, moist, light brown.
	SAND, fine, moist, light brown.
	SAND, fine,some gravel, moist, light brown.
20	SAND, fine, with gravel, moist, light brown, some gray and black.
	SAND, fine to coarse, trace gravel, moist, brown.
	SAND, medium to coarse, trace gravel, moist, brown.
	SAND, medium to coarse, trace gravel, wet, brown.
	SAND, medium to coarse, trace gravel, wet, gray.
30	SILT, wet.
	SAND, medium to coarse, trace gravel, wet, gray.
	SILT and SAND, fine, wet, gray.
	SILT, with sand, wet, gray.
	SAND, fine, wet, gray.
	SAND, medium to coarse, wet, gray.
	SAND, fine, with silt, wet, gray.
	SAND, medium to coarse, wet, gray.
40	SAND, fine, wet, gray.
	SAND, medium to coarse, trace gravel, wet, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 2.5', 0.010-inch PVC slot screen

Bentonite Chips

Natural Collapse

SAMPLE INFORMATION						
Sample Interval	ANALYTICAL RESULTS (ug/L) Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1740		2.7	Hand Augered		100 %
☒	1745		3.6	Hand Augered		100 %
☒	1750		3.3	3-5-3-3		95 %
☒	0910		1.9	2-3-3-3		90 %
☒	0914		3.3	2-3-3-3		90 %
☒	0918		4.7	2-3-4-4		100 %
☒	0923		5.6	2-4-4-4		100 %
☒	0930		5.1	3-4-5-7		100 %
☒	0935		7	4-6-7-7		100 %
☒	0943		8	4-6-7-10		100 %
☒	0947		10.6	5-5-6-8		100 %
☒	0955		11.8	3-4-5-5		100 %
☒	1004		13.8	3-3-3-3		85 %
☒	1010		113	1-1-2-1		90 %
☒	1017		130	1-0.5-0.5-1		80 %
☒	0925		136	1		90 %
☒	1035		54	1		85 %
☒	1110		83	0-2-2-3		75 %
☒	1125		37	2-2-2-2		80 %
☒	1140		29.7	1		60 %
☒	1200		9.8	0-0-2-3		90 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	28.8-31.2
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW76(30)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

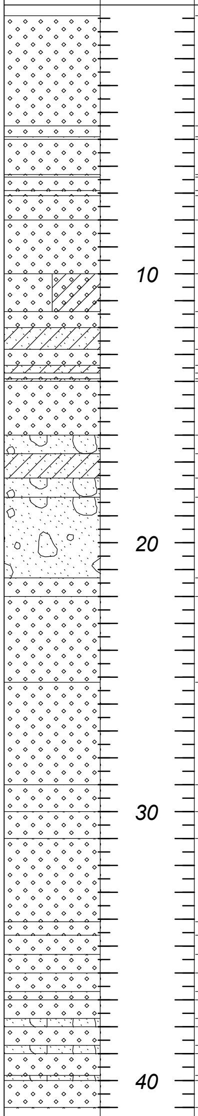
CLIENT:	**Textron**	NORTHING:	**2138583.9**
PROJECT NAME:	**TORX Facility**	EASTING:	**173758.28**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.76**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.39**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**41**
DATE DRILLED:	**10/18/12**		

B77 / MW77

Soil Sampling Data

SHEET **1** OF **1**

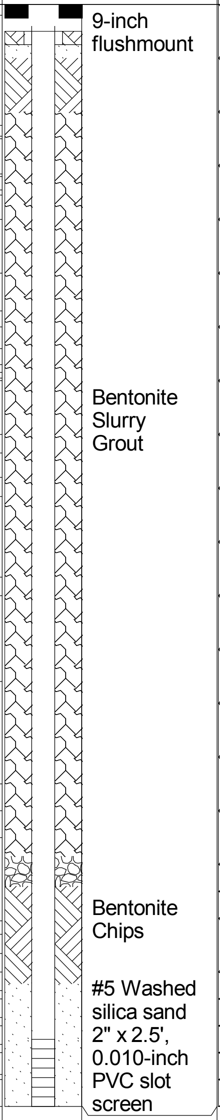
STRATA / DEPTH FEET



DESCRIPTION

- CONCRETE
- SAND, fine, dry, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, dry, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, moist, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, moist, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, trace clay, moist, light brown.
- SAND, fine, with interbedded clayey sand, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, trace gravel, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, fine, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, fine, moist, brown.
- SAND, fine, with interbedded clayey sand, moist, light brown.
- SAND and GRAVEL, trace clay, moist, dark brown.
- SAND, clayey, fine, moist, brown.
- SAND and GRAVEL, trace clay, moist, dark brown.
- SAND and GRAVEL, trace silt, trace clay, moist, dark brown.
- SAND, medium to coarse, moist, brown.
- SAND, fine to medium, trace silt, moist, light brown.
- SAND, fine to medium, wet, oily, gray.
- SAND, fine to coarse, wet, oily, gray.
- SAND, medium to coarse, wet, gray.
- SAND, fine, with silt, wet, oily, gray.
- SAND, fine to medium, wet, gray.
- SAND, very fine, with silt, wet, gray.
- SAND, fine to medium, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND, fine to coarse, with gravel, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, medium to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, medium to coarse, some gravel, wet, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	0950		6.9	Hand Augered		100 %
	0955		5.7	Hand Augered		100 %
	1015		6.2	3-6-6-7		100 %
	1030		9.5	3-4-5-5		100 %
	1035		17.2	3-4-3-4		100 %
	1045		39.2	3-3-3-4		100 %
	1050		49.5	3-2-3-3		100 %
	1055		58.6	2-2-2-3		100 %
	1058		52	1-1-1-1		90 %
	1100		22.6	1-1-1-1		95 %
	1105		34.8	1-2-1-2		95 %
	1110		23	2-2-2-2		100 %
	1115		212	2-2-1-2		100 %
	1120		515	1-1-1		100 %
	1145		206	1		100 %
	1300		200	0		80 %
	1445		218	2-2		100 %
	1450		127	2-3		90 %
	1500		108	1-1-2-2		100 %
	1512		30.7	0		100 %
	1520		8.2	0		70 %
	1530		21.1	0		80 %
	1540		14.6	0-1		130 %
	1600		9.4	2-2		180 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	38.5-40.9
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW77(40)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

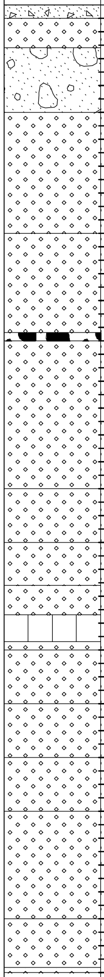
CLIENT:	**Textron**	NORTHING:	**2138587.05**
PROJECT NAME:	**TORX Facility**	EASTING:	**173807.85**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.70**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.30**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**36**
DATE DRILLED:	**10/15-16/12**		

B78 / MW78

Soil Sampling Data

SHEET **1** OF **1**

STRATA

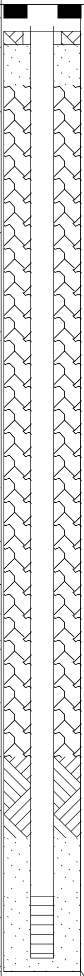


DEPTH FEET: 10, 20, 30

DESCRIPTION

- CONCRETE
- SAND, fine, some gravel and cobbles, dry, brown.
- SAND and GRAVEL, fine, some silt, dry, brown.
- SAND, fine, with fine gravel, dry, brown.
- SAND, fine to coarse, some gravel, dry, brown.
- GRAVEL, fine, some sand, moist, brown.
- SAND, fine to medium, trace fine gravel, moist, light brown.
- SAND, fine to medium, moist, light brown to black.
- SAND, fine to medium, trace gravel, moist, light brown, some black.
- SAND, fine to medium, moist, light brown to black.
- Silt, some fine sand, moist, brown.
- SAND, fine to medium, moist, light brown.
- SAND, fine to medium, trace gravel, wet, light brown.
- SAND, fine to medium, trace gravel, wet, gray.
- SAND, fine to coarse, trace gravel, wet, gray.
- SAND, medium to coarse, trace gravel, wet, gray.
- SAND, medium to coarse, with gravel, wet, gray.
- SAND, fine to medium, with gravel, trace silt and clay, moist, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 2.5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
1715		3.3	Hand Augered		100 %
1725		4.8	Hand Augered		100 %
1730		7.4	2-4-4-3		65 %
1740		7.4	2-3-4-2		55 %
1745		8.4	2-2-3-3		65 %
1748		9.2	2-2-3-4		65 %
0854		9	2-3-5-5		60 %
0858		12.1	2-4-5-6		80 %
0908		11.8	3-3-3-2		85 %
0910		12	2-3-5-7		70 %
0921		11.7	4-6-7-9		95 %
0927		34.6	4-6-9-9		100 %
0932		49.3	4-5-5-4		100 %
0940		45.3	2-2-1-1		70 %
1000		126	1-2-1-1		65 %
1004		136	2-4-6-8		100 %
1014		84	2-4-4-8		100 %
1033		4.6	5-14-18-18		100 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	33.2-35.5
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW78(35)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

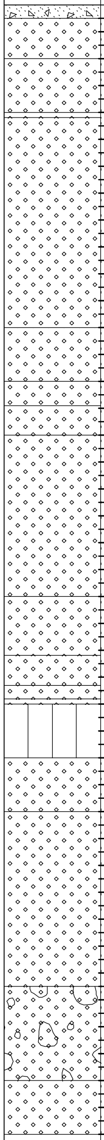
TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

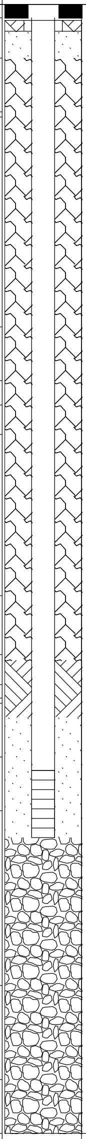
CLIENT:	**Textron**	NORTHING:	**2138539.75**
PROJECT NAME:	**TORX Facility**	EASTING:	**173767.19**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.73**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.26**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**42**
DATE DRILLED:	**10/19/12**		

B79 / MW79

Soil Sampling Data

SHEET **1** OF **1**





DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	CONCRETE SAND, fine, dry, brown.	9-inch flushmount	☒	1130		4.7	Hand Augered		100 %
	SAND, some gravel, trace clay, trace cobble, moist, brown.		☒	1155		8.6	Hand Augered		100 %
	SAND, with gravel, moist, brown. SAND, with gravel, dry, light brown.		☒	1315		5.3	3-3-2-3		55 %
			☒	1325		7.1	3-2-3-2		90 %
			☒	1330		5.5	3-2-3-4		15 %
10			☒	1335		3	4-2-2-3		15 %
	SAND, with gravel, moist, brown.		☒	1350		18	2-3-4-5		25 %
	SAND, fine to coarse, some gravel, moist, brown.	Bentonite Slurry Grout	☒	1405		13	3-3-2-4		70 %
	SAND, fine to medium, some gravel, moist, brown.		☒	1410		11	2-3-5-5		70 %
	SAND, fine, trace fine gravel, moist, light brown.		☒	1517		16.4	3-4-6-7		85 %
20			☒	1420		13.2	4-4-4-4		85 %
	SAND, fine, some silt, moist, brown.		☒	1425		16.6	1-2-2-2		100 %
	SAND, fine to medium, some silt and clay, moist, brown-gray.	Bentonite Chips	☒	1433		65	1-2-2-1		90 %
	SAND, fine, wet, gray. SAND, fine, some silt, wet, gray.	#5 Washed silica sand	☒	1440		148	2-3-3-4		90 %
	SILT, with fine sand, wet, gray.	2" x 2.5', 0.010-inch PVC slot screen	☒	1445		56	1-1-1-3		75 %
30	SAND, fine to coarse, some fine gravel, wet, gray. SAND, fine to medium, some coarse sand, trace gravel, wet, gray.		☒	1500		9.8	1-1-1-4		80 %
			☒	1505		3.7	1-3-6-7		75 %
			☒	1517		3	0-0-1-2		75 %
	SAND and GRAVEL, trace silt, wet, brown.		☒	1535		3	0-4-4-4		70 %
			☒	1543		3	0-4-7-8		70 %
40	SAND, medium to coarse, and gravel, wet, gray.		☒	1555		3	0-5-3-5		80 %

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	28.5-30.9
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW79(30)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138591.63**
PROJECT NAME:	**TORX Facility**	EASTING:	**173578.4**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**793.33**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**792.99**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**22**
DATE DRILLED:	**10/16/2012**		

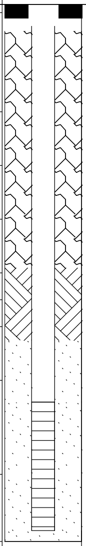
B80 / MW80

Soil Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION
	SILT and SAND, fine to medium, organics, moist, brown.
	No Recovery.
	SAND, fine to medium, trace fine gravel, trace fines, moist, gray.
	SAND, fine to medium, trace fines, moist, gray.
	SAND, clayey, fine to medium, trace coarse sand, trace gravel, moist, gray.
10	CLAY, sandy, trace gravel, moist, gray.
	SAND, clayey, fine to medium, trace fine gravel, trace coarse sand, saturated, gray.
	SAND, fine to coarse, trace fine gravel, trace clay, saturated, gray.
	SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
	SAND, fine, some silt, saturated, gray.
20	SILT and SAND, fine, saturated, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	0950		1.3	1-1-2-2		15 %
☒	0953			1-1-3-5		No recovery
☒	0959		1.7	1-1-2-2		60 %
☒	1005		1.8	1-1-1-1		50 %
☒	1008		3.1	4-2-1-1		60 %
☒	1015		2.8	0-1-1-1		75 %
☒	1021		2.9	0-0-0-1		80 %
☒	1027		2.9	0-0-1-1		75 %
☒	1032		2.4	0-0-0-0		80 %
☒	1037		2.3	0-0-0-1		90 %
☒	1042		2.5	0-1-2-2		90 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	14.8-19.6
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW80(19)**

amec

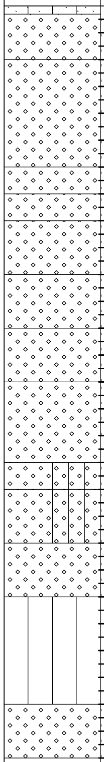
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

B81 / MW81(27)

Soil Sampling Data

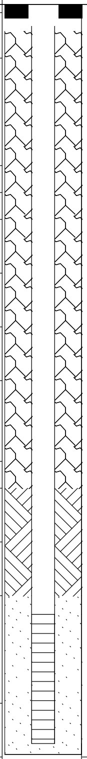
CLIENT:	**Textron**	NORTHING:	**2138636.03**
PROJECT NAME:	**TORX Facility**	EASTING:	**173625.89**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.56**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.34**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**28**
DATE DRILLED:	**10/15/2012**		

SHEET **1** OF **1**



DEPTH FEET	DESCRIPTION
	SILT and SAND, fine to coarse, organics, moist, black.
	SAND, fine to medium, traces fines, trace clay, moist, brown to tan.
	SAND, fine to medium, trace fine gravel, trace coarse sand, trace silt, trace clay, moist, brown.
	SAND, fine to medium, trace fine gravel, trace coarse sand, moist, brown.
	SAND, fine to medium, trace fines, trace clay, moist, blackish-gray.
10	SAND, fine to medium, trace fines, trace clay, moist, dark-gray.
	SAND, fine to coarse, traces fines, moist, gray.
	SAND, medium to coarse, trace fines, trace clay, gray, moist. Oily feel to sediments.
	SAND, fine to coarse, trace fines, trace clay, saturated, gray.
	SILT and SAND, fine, trace fine gravel, saturated, gray.
20	SILT and SAND, fine, trace medium sand, saturated, gray.
	SAND, fine, some silt, trace medium sand, saturated, gray.
	SILT, trace fine sand, trace clay, saturated, gray
	SAND, fine to coarse, trace fine gravel, saturated, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1422		1.1	1-2-3-4		75 %
☒	1430		3.1	2-2-2-2		60 %
☒	1436		7.6	1-3-4-5		15 %
☒	1510		9.2	1-3-3-1		35 %
☒	1518		81.2	1-1-1-2		50 %
☒	1523		26.8	2-3-4-5		65 %
☒	1530 1600		6.4	2-2-3-3	B81-S(10-12)	70 %
☒	1535		4.4	1-2-2-2		90 %
☒	1548		0	1-1-1-1		85 %
☒	1655		486	1-1-1-1		95 %
☒	1701		397	0-0-0-1		85 %
☒	1710		59.6	1-1-1-1		55 %
☒	17113		86.7	1-1-2-2		55 %
☒	1719		30.1	2-3-5-7		25 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	22.9-27.7
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW81(27)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138640.29**
PROJECT NAME:	**TORX Facility**	EASTING:	**173624.81**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.28**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**Not Applicable**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**50**
DATE DRILLED:	**10/20-21/2012**		

B81 OFFSET

Soil Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION
	See B81/MW81 Description for 0 to 10 feet below ground surface lithology.
10	SAND, fine to coarse, trace fines, moist, gray.
	SAND, fine to coarse, trace fines, trace clay, saturated, gray.
	SAND and SILT, fine, saturated, gray.
	SAND and SILT, fine to medium, saturated, gray.
20	SAND, fine to medium, some silt, saturated, gray.
	SILT and SAND, fine, saturated, gray.
	SILT, trace fine sand, saturate, gray.
	SILT and SAND, fine, saturated, gray.
30	SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
	SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.
	SAND, fine, some silt, saturated, brownish-gray.
	SAND, fine to coarse, trace fine gravel, saturated, brownish-gray.
	SILT, trace fine sand, saturated, brown.
	SILT, trace fine sand, trace clay, saturated, brown.
40	SILT, with fine sand, saturated, brown.
	SILT, with fine sand, trace medium sand, saturated, brown.
	CLAY, sandy, trace fine gravel, trace fine to coarse sand, stiff, moist, gray.

WELL CONSTRUCTION DETAIL

Boring was grouted from total depth drilled to 2.5 feet below ground surfces with a bentonite slurry .

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	1548		50	4-4-4-5		55 %
	1557		20	2-3-3-4		40 %
	1601		4.4	1-2-1-2		80 %
	1608		4.1	1-2-1-1		80 %
	1614		237	1-0-0-1		85 %
	1619		296	0-0-0-1		55 %
	1625		22.1	0-1-1-1		55 %
	1629		17.6	1-1-2-2		85 %
	1635		24.1	2-5-6-8		65 %
	1647		53.2	4-6-5-5		75 %
	1653		37.8	2-2-4-5		50 %
	1703		35.1	1-2-5-10		40 %
	1711		20.6	5-6-7-6		85 %
	1030		2.7	3-5-11-9		25 %
	1046		3.5	9-9-7-5		70 %
	1100		3.1	3-3-7-10		60 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	Not Applicable
Screen Size:	Not Applicable
Well Material:	Not Applicable
Grout Type:	Bentonite Slurry

REMARKS **B81 OFFSET, Well not installed**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138574.35**
PROJECT NAME:	**TORX Facility**	EASTING:	**174009.43**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**807.73**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.38**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**58.7**
DATE DRILLED:	**10/29-30/2012**		

B82 / MW82

Soil Sampling Data

SHEET **1** OF **2**

STRATA | DEPTH FEET: 10, 20, 30, 40

DESCRIPTION

SAND, fine, grass and roots, trace silt, dry, brown.

SAND, fine, grass and roots, trace silt, dry, light brown.

SAND, fine, to gravel, trace silt, dry, red orange.

SAND, fine to coarse, little fine gravel, trace silt, dry, brown-gray.

SAND, fine, gravel, little silt, dry, brown.

SAND, fine to coarse, little gravel, trace silt, dry, brown gray.

SAND, medium to coarse, little fine sand, little fine gravel, trace silt, dry, brown.

SAND, fine to medium, little coarse sand, trace silt, trace gravel, dry, brown.

SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, dry, brown.

SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, saturated, brown.

SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, saturated, gray.

SAND, fine to medium, little silt, little coarse sand, trace fine gravel, saturated, gray.

SAND, fine to coarse, little fine gravel, little silt, trace clay, saturated, gray.

SAND, fine to coarse, little silt, trace fine to medium gravel, saturated, gray.

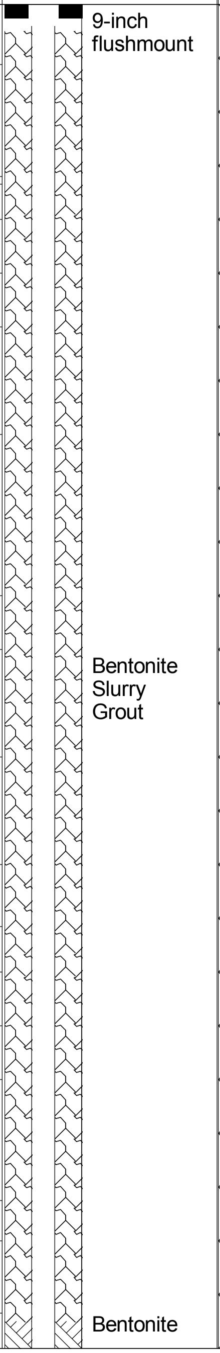
SAND and GRAVEL, fine to coarse, little silt, little clay, saturated, gray.

SAND, fine to coarse, little gravel, little silt, little clay, saturated, gray.

SAND, fine to medium, some silt, little coarse sand, trace gravel, saturated, brown-gray.

SAND, fine to coarse, little silt, trace gravel, trace clay, saturated, brown-gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒			1	2-2-2-2		71 %
☒			1.1	2-2-2-2		71 %
☒			1.1	2-2-4-4		50 %
☒			0.9	3-4-4-3		58 %
☒			1.4	2-1-2-2		35 %
☒			1.9	2-2-2-2		45 %
☒			1.7	1-2-2-3		50 %
☒			1.5	3-3-5-3		60 %
☒			1.7	1-4-4-5		60 %
☒			3.9	3-4-6-6		70 %
☒			4.1	2-4-5-7		85 %
☒			3	2-5-6-6		70 %
☒			37.8	2-3-4-5		85 %
☒			96.5	3-4-5-6		45 %
☒			196	4-6-10-10		85 %
☒			110	3-6-12-14		75 %
☒			75.1	2-3-7-7		50 %
☒			68.7	6-11-15-15		75 %
☒			73.5	3-5-10-12		65 %
☒			22.5	5-6-6-7		70 %
☒			21	3-5-8-8		55 %
☒			20.3	4-8-10-14		70 %
☒			40.2	7-9-11-14		55 %
☒			39.6	5-8-10-12		60 %
☒			16.3	9-10-11-14		65 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	53.4-58.2
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW82(58)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

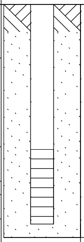
CLIENT:	**Textron**	NORTHING:	**2138574.35**
PROJECT NAME:	**TORX Facility**	EASTING:	**174009.43**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**807.73**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.38**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**58.7**
DATE DRILLED:	**10/29-30/2012**		

B82 / MW82

Soil Sampling Data

SHEET **2** OF **2**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL
		SAND, fine to medium, some coarse sand, some silt, trace clay, saturated, brown-gray. *(continued)*	Chips
		SAND, fine to medium, little silt, little coarse sand, trace fine gravel, saturated, brown-gray.	#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen
		SAND, fine, silty, saturated, brown-gray.	
		SAND, fine to medium, little coarse sand, little silt, saturated, brown-gray.	
		SILT, little clay, saturated, gray.	



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒			22.9	2-6-10-12		45 %
☒			27.1	5-8-11-13		40 %
☒			4.2	4-10-12-27		75 %
☒			3.6	3-9-13-17		65 %

ANALYTICAL RESULTS (ug/L)

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

CLIENT:	**Textron**	NORTHING:	**2138484.61**
PROJECT NAME:	**TORX Facility**	EASTING:	**174040.64**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**808.11**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.67**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**64**
DATE DRILLED:	**10/31/12-11/01/12**		

B83 / MW83

Soil Sampling Data

SHEET **1** OF **2**

DEPTH FEET	DESCRIPTION
	SAND, fine, silty, organics, moist.
	SAND, fine, silty, dry, light brown.
	SAND, fine, silty, little clay, dry, light brown.
	SAND, medium to coarse, clayey, little fine sand, very stiff, moist, brown.
10	SAND, fine to coarse, trace silt, trace gravel, dry, brown.
	SAND, fine to coarse, little gravel, trace silt, dry, brown.
20	SAND, fine to medium, trace coarse sand, trace silt, dry, brown.
	SAND, fine to medium, little silt, trace coarse sand, trace fine gravel, moist, brown.
	GRAVEL, some fine to medium sand, little silt, satruated, brown.
30	SAND, fine to coarse, some silt, little fine gravel, trace medium gravel, saturated, brown-gray.
	SAND and GRAVEL, fine to coarse, silty, saturated, brown-gray.
	SAND, fine to coarse, silty, little fine gravel, trace medium gravel, saturated, gray.
40	SAND, fine, silty, little medium sand, trace coarse sand, trace fine gravel, saturated, brown-gray.
	SAND, fine, silty, trace medium sand, saturated, brown-gray.
	SAND and GRAVEL, fine to coarse, silty, saturated, brown.
	SAND, fine to coarse, little silt, little fine gravel, trace medium gravel, saturated, brown-gray.
	SILT, saturated, brown to gray.
	SAND, fine, silty, saturated, brown.

WELL CONSTRUCTION DETAIL: 9-inch flushmount; Bentonite Slurry Grout

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
			1.2	1-2-2-3		100 %
			0.4	3-4-6-6		100 %
			1.9	3-5-8-9		60 %
			2	2-6-6-6		65 %
			1.6	2-3-3-3		75 %
			1.4	2-3-3-4		50 %
			1.5	2-2-3-4		65 %
			1.8	3-4-6-9		55 %
			2.1	2-4-5-5		45 %
			2.2	5-9-9-11		65 %
			2.2	4-6-8-10		80 %
			3	1-1-1-1		55 %
			3.4	3-6-6-6		100 %
			9.6	2-3-5-6		60 %
			9.1	3-7-11-14		65 %
			6.1	3-7-9-12		60 %
			3.9	5-8-13-19		50 %
			3.7	5-10-14-21		85 %
			3.3	3-5-7-6		50 %
			2.3	3-5-15-18		75 %
			2.3	5-8-11-13		65 %
			1.5	3-5-8-8		50 %
			3.5	7-15-16-18		80 %
			2.4	5-12-15-17		45 %
			1.2	9-12-12-13		85 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	59.2-64.0
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW83(64)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138484.61**
PROJECT NAME:	**TORX Facility**	EASTING:	**174040.64**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**808.11**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.67**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**64**
DATE DRILLED:	**10/31/12-11/01/12**		

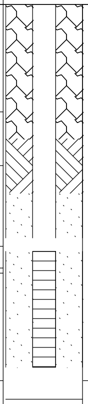
B83 / MW83

Soil Sampling Data

SHEET **2** OF **2**

STRATA	DEPTH FEET	DESCRIPTION
		SILT, clayey, little fine sand, saturated, gray.
		SAND, fine to medium, silty, trace coarse sand, trace fine gravel, saturated, brown.
		SAND, fine to medium, trace coarse sand, trace fine gravel, little silt, saturated, brown-gray. *(continued)*
		SAND, fine to coarse, silty, little gravel, little clay, saturated, brown-gray.
		SAND, fine to medium, trace coarse sand, trace gravel, little silt, saturated, brown-gray.
	60	SAND, silty, saturated, brown.
		SILT, sandy, fine, saturated, brown.
		SAND, fine to medium, little silt, saturated, brown-gray.

WELL CONSTRUCTION DETAIL



Bentonite Chips

#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒			2.2	3-3-7-10		50 %
☒			2.6	8-10-10-14		60 %
☒			2.7	5-8-15-21		35 %
☒			2.7	2-3-5-6		80 %
☒			2.1	7-12-13-16		100 %
☒			1.1	7-4-5-9		30 %
☒			1.5	7-10-11-17		100 %

ANALYTICAL RESULTS (ug/L)

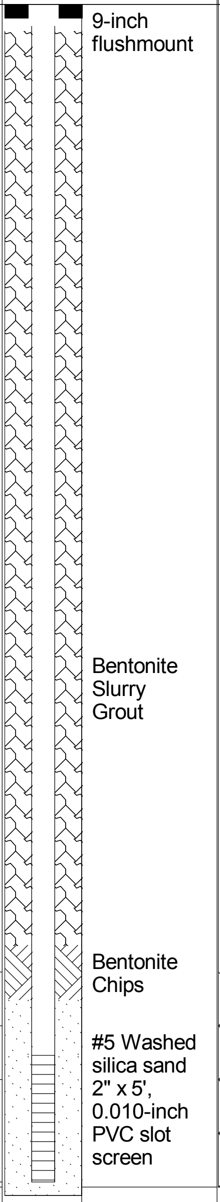
CLIENT:	**Textron**	NORTHING:	**2138350.48**
PROJECT NAME:	**TORX Facility**	EASTING:	**174151.56**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**822.46**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**824.91**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**44**
DATE DRILLED:	**11/04/2012**		

B84 / MW84(44)

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	0–36	See B84 / MW84(65) Description for 0 to 36 feet below ground surface lithology.								See B84 / MW84(65) for lithology from 0 to 36 feet below ground surface.
	36–38	SAND, fine to medium, little coarse sand, trace fine to medium gravel, trace silt, dry, brown.		☒			0.9	3-6-7-8		70 %
	38–40	SAND, fine to medium, little coarse sand, little silt, trace fine to medium gravel, mosit to saturated, brown.		☒			3.5	4-4-4-4		50 %
	40–42	SAND, fine to medium, little coarse sand, little silt, trace fine to medium gravel, saturated, brown.		☒				2-3-3-7		65 %
	42–44	SILT, clayey, little fine sand, saturated, brown.		☒			1.8	3-3-4-6		100 %



Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	39.1-43.8
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW84(44)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **D. Gross**
DATE DRILLED: **11/03/12**

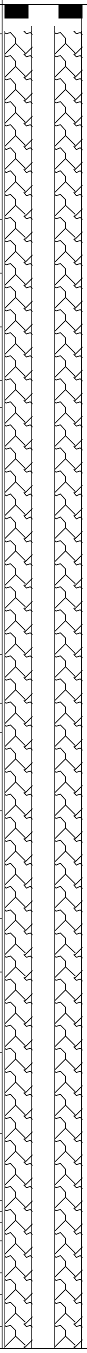
NORTHING: **2138354.76**
EASTING: **174151.41**
GROUND SURFACE ELEVATION (feet): **822.31**
TOP OF CASING ELEVATION (feet): **824.56**
TOTAL DEPTH OF BORING (feet BGS): **76**

B84 / MW84(65)

Soil Sampling Data

SHEET **1** OF **2**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL
		CLAY, silty, some fine to coarse sand and gravel, moist, dark brown to brown.	9-inch flushmount
		SAND, fine to coarse, silty, fine gravel, littel medium gravel, dry, light-brown.	
		SAND, fine, little silt, dry, light brown.	
	10	SAND, fine, some silt, dry, light brown.	
		SILT, sandy, fine, dry, brown.	
		SAND, fine, silty, dry, brown.	
		SAND, fine to medium, dry, brown-gray.	
	20		
		SAND, fine, silty, dry, brown.	Bentonite Slurry Grout
		SILT, moist, brown.	
		SAND and GRAVEL, fine to coarse, little silt, moist, brown-gray.	
	30	SAND, fine to coarse, little fine gravel, little silt, trace medium gravel, trace clay,dry, brown.	
		SAND, fine to medium, little coarse sand, trace fine to medium gravel, trace silt, trace clay, dry, brown.	
		SAND, fine to coarse, little coarse sand, trace fine to medium gravel, trace silt, trace clay, dry, brown.	
	40	SAND, fine to coarse, little coarse sand, trace fine to medium gravel, little silt, trace clay, saturated, brown.	
		SAND, fine to medium, trace coarse sand and garvel, little silt, saturated, brown.	
		SAND, fine, silty, saturated, brown.	
		SAND, fine, little clay, silty, saturated, brown.	
		SILT, clayey, little fine sand, saturated, brown.	
		SILT, sandy, fine, little clay, saturated, brown.	



SAMPLE INFORMATION						
	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒			2.5	1-2-2-3		65 %
☒			2.1	3-2-3-2		65 %
☒			2.3	3-4-5-4		45 %
☒			1.4	6-9-10-10		45 %
☒			1.9	6-11-15-18		75 %
☒			2.6	9-11-14-7		65 %
☒			2.9	3-7-8-7		90 %
☒			2.4	5-7-7-8		95 %
☒			2.1	3-4-5-6		75 %
☒			2.4	3-4-6-6		75 %
☒			2.2	4-7-10-12		95 %
☒			0.5	4-5-7-8		75 %
☒			2	4-7-8-10		70 %
☒			2.5	5-7-9-14		70 %
☒			3.2	11-15-16-12		65 %
☒			2.1	10-15-16-18		70 %
☒			2.3	8-10-12-16		65 %
☒			1.9	5-8-10-12		80 %
☒			1	4-6-8-7		65 %
☒			1.1	4-4-5-5		85 %
☒			1.6	3-4-5-6		75 %
☒			1.4	3-3-4-6		50 %
☒			2	4-6-10-12		100 %
☒			2.3	3-5-6-6		85 %
☒			1.6	2-3-5-6		75 %

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 60.7-65.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW84(65)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

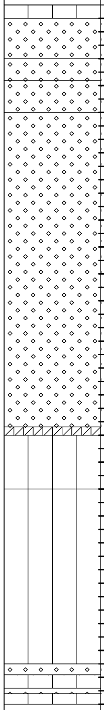
CLIENT:	**Textron**	NORTHING:	**2138354.76**
PROJECT NAME:	**TORX Facility**	EASTING:	**174151.41**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**822.31**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**824.56**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**76**
DATE DRILLED:	**11/03/12**		

B84 / MW84(65)

Soil Sampling Data

SHEET **2** OF **2**

STRATA | DEPTH FEET | DESCRIPTION | WELL CONSTRUCTION DETAIL



DEPTH FEET: 60, 70

DESCRIPTION:

SAND, fine, silty, little clay, saturated, brown-gray.

SILT, sandy, fine, little clay, saturated, brown.

SAND, fine, silty, little clay, saturated, brown.

SILT, clayey, little fine sand, saturated, brown.

SAND, fine, little silt, saturated, brown-gray.

SAND, fine to medium, trace silt, saturated, brown-gray.

SAND, fine, little silt, saturated, brown.

SAND, fine, trace medium to coarse sand, trace silt, saturated, brown.

CLAY, silty, some fine to medium sand, little coarse sand, little fine gravel, moist, brown-gray.

SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.

SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, lenses of fine sand, moist, gray.

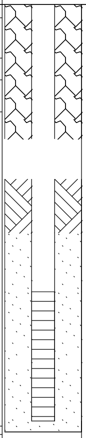
SAND, medium to coarse, silty, gray.

SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.

SAND, medium to coarse, silty, gray.

SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.

WELL CONSTRUCTION DETAIL:



Bentonite Chips

#5 Washed silica sand
2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

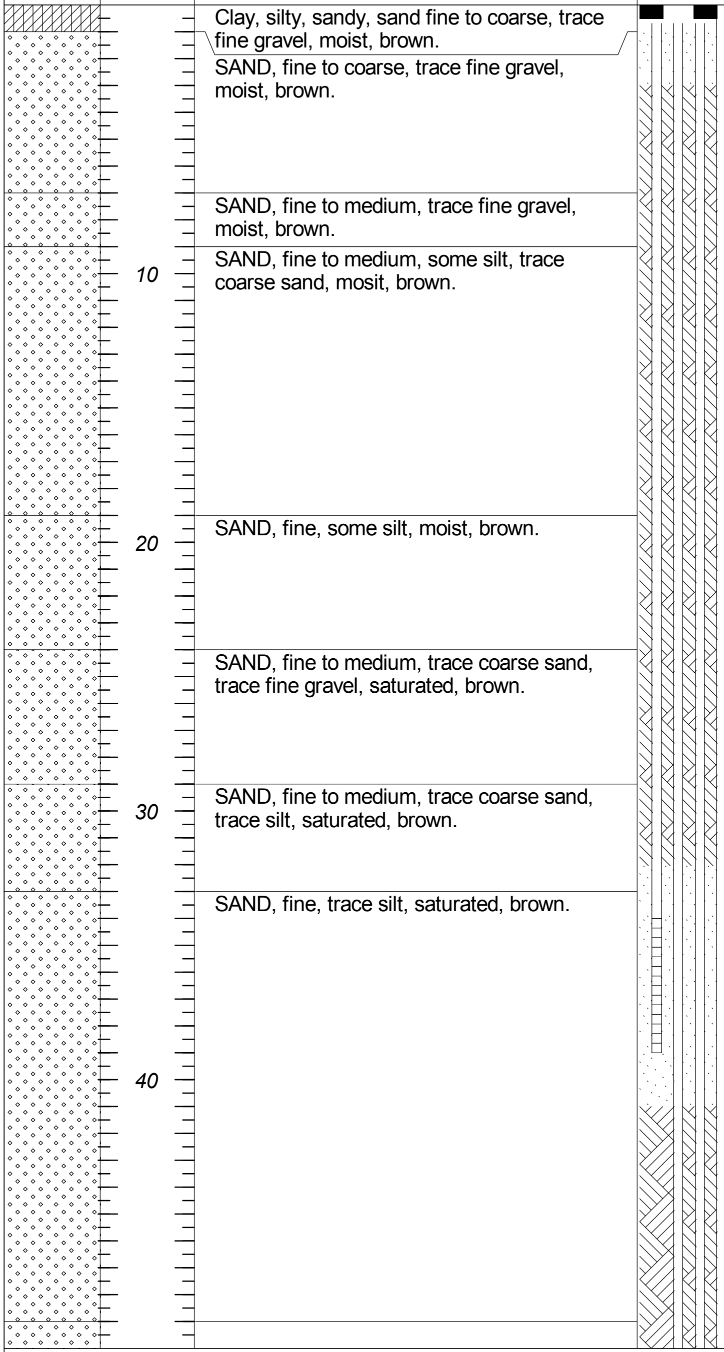
Sample Interval	ANALYTICAL RESULTS (ug/L) Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
			1.8	5-7-8-13		100 %
			2.3	3-6-13-17		90 %
			1.7	2-3-7-13		100 %
			2.5	6-9-11-18		100 %
			1.4	4-9-17-19		65 %
			1.9	4-8-13-15		65 %
			2.1	2-2-4-6		40 %
			2.3	4-5-9-13		100 %
			1	4-6-6-7		85 %
			1.2	2-6-7-2		100 %
			2.1	1-2-2-5		100 %
			1.1	2-5-5-4		75 %
			1.8	3-6-4-4		100 %

CLIENT:	**Textron**	NORTHING:	**2138920.12**	
PROJECT NAME:	**TORX Facility**	EASTING:	**174779.44**	
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**797.03**	
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**See Remarks**	
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**150**	
DATE DRILLED:	**11/27-30/12**			

B85 / MW85

Soil Sampling Data

SHEET **1** OF **3**



				SAMPLE INFORMATION							
					ANALYTICAL RESULTS (ug/L)						
STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
		Clay, silty, sandy, sand fine to coarse, trace fine gravel, moist, brown.	14-inch flushmount							
		SAND, fine to coarse, trace fine gravel, moist, brown.								
		SAND, fine to medium, trace fine gravel, moist, brown.								
	10	SAND, fine to medium, some silt, trace coarse sand, mosit, brown.	Bentonite Chips							
	20	SAND, fine, some silt, moist, brown.								
		SAND, fine to medium, trace coarse sand, trace fine gravel, saturated, brown.								
	30	SAND, fine to medium, trace coarse sand, trace silt, saturated, brown.								
	40	SAND, fine, trace silt, saturated, brown.	#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen Bentonite Chips							

Driller:	Stearns Drilling
Method (type & size):	4" x 6" Rotosonic
Screened Interval (ft. bgs):	34-39; 64-69; 124-129
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite

REMARKS **MW85(39) =796.49 ; MW85(70) = 796.44; MW85(130) = 796.46**

amec

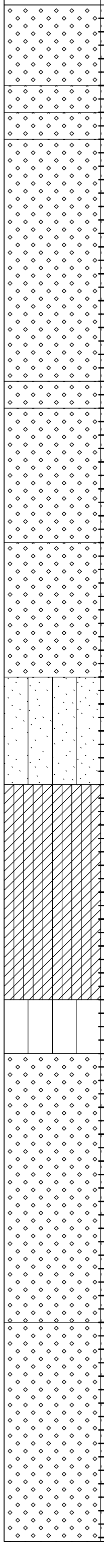
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

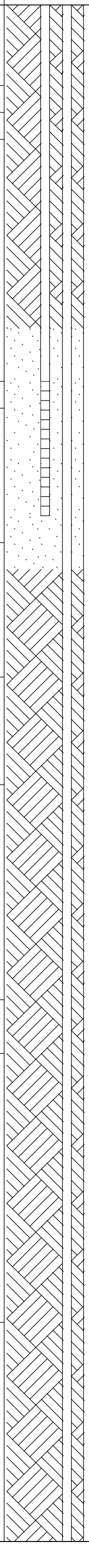
CLIENT:	**Textron**	NORTHING:	**2138920.12**	
PROJECT NAME:	**TORX Facility**	EASTING:	**174779.44**	
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**797.03**	
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**See Remarks**	
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**150**	
DATE DRILLED:	**11/27-30/12**			

B85 / MW85

Soil Sampling Data

SHEET **2** OF **3**





STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	SAMPLE INFORMATION							
					ANALYTICAL RESULTS (ug/L)						
				Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS	
		SAND, fine to medium, trace silt, saturated, grayish-brown. *(continued)*									
		SAND, fine, some silt, saturated, grayish-brown.									
		SAND, fine, some silt, saturated, gray.									
		SAND, fine to medium, trace silt, saturated, brown.									
	60										
			#5 Washed silica sand								
		SAND, medium, saturated, orange-brown.									
		SAND, fine to medium, trace silt, saturated, gray.	2" x 5', 0.010-inch PVC slot screen								
	70	SAND, fine, some silt, trace clay, saturated, gray.									
		SILT and SAND, fine, some clay, saturated, gray.									
	80	CLAY, silty, sandy, interbedded fine to medium sand, trace coarse sand, trace fine gravel, moist, gray.									
		SILT, some clay, trace fine sand, trace coarse sand, saturated, gray.									
	90	SAND, fine to medium, trace coarse sand, trace silt, saturated, gray.	Bentonite Chips								
	100	SAND, fine to medium, trace silt, trace fine gravel, saturated, gray.									

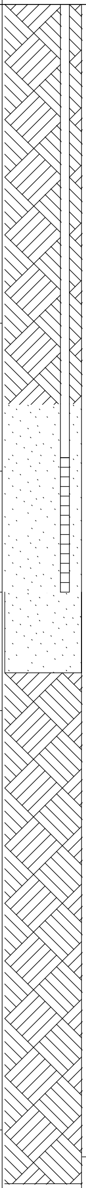
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **11/27-30/12**

NORTHING: **2138920.12**
EASTING: **174779.44**
GROUND SURFACE ELEVATION (feet): **797.03**
TOP OF CASING ELEVATION (feet): **See Remarks**
TOTAL DEPTH OF BORING (feet BGS): **150**

B85 / MW85

Soil Sampling Data

SHEET **3** OF **3**



STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
				SAMPLE INFORMATION						
					ANALYTICAL RESULTS (ug/L)					
	110	SAND, fine to medium, trace silt, trace fine gravel, saturated, gray. *(continued)*								
	120	SAND, fine to medium ,trace silt, saturated, gray.	#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen							
		SAND, fine, trace silt, saturated, gray.								
	130	CLAY, silty, some fine sand, trace fine gravel, moist, stiff, gray.								
	140	SAND, fine to coarse, with clay, with silt, trace fine to medium gravel, moist, gray.	Bentonite Chips							
	150	BEDROCK, drill tooling refusal.								

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **12/01/2012**

NORTHING: **2138267.89**
EASTING: **174393.75**
GROUND SURFACE ELEVATION (feet): **791.48**
TOP OF CASING ELEVATION (feet): **Not Applicable**
TOTAL DEPTH OF BORING (feet BGS): **50**

B86

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	SAMPLE INFORMATION Sample Interval	ANALYTICAL RESULTS (ug/L) Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
		SILT, clayey, moist, brown.								
		SAND and GRAVEL, moist, brown.								80 %
		SAND and GRAVEl, wet, brown.								10 %
	10	SAND, with gravel, wet, black.								
		SAND and GRAVEl, trace cobble, silty, light brown.								
		SAND, fine to coarse, wet, light brown.								
		GRAVEL, with coarse sand, wet, light brown.								
		SILT, moist, gray.								
	20	SAND, fine to coarse, wet, gray.								50 %
		SAND, fine wet, gray.	Boring was grouted from total depth drilled to 2.5 feet below ground surfaces with a bentonite slurry .							
		SAND, medium to coarse, wet, brown.								
	30	SAND, fine to medium, wet, brown.								50 %
		SILT, wet, gray.								
		SAND, fine, wet, gray.								
		SAND, some silt, wet, gray, some brown oxidation and black iron.								
		SAND, fine to medium, gray, with brown oxidation.								90 %
	40	SAND, fine, wet, gray with brown oxidation, some black staining.								
		SAND, fine, with fine gravel, wet, gray.								
		SAND, medium to coarse, with gravel, wet, gray.								70 %

Driller: Stearns Drilling
Method (type & size): 4" x 6" Rotosonic
Screened Interval (ft. bgs): Not Applicable

Screen Size: Not Applicable
Well Material: Not Applicable
Grout Type: Bentonite Slurry

REMARKS **Well not installed**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **12/01/2012**

NORTHING: **2138263.64**
EASTING: **174384.21**
GROUND SURFACE ELEVATION (feet): **792.70**
TOP OF CASING ELEVATION (feet): **Not Applicable**
TOTAL DEPTH OF BORING (feet BGS): **60**

B87

Soil Sampling Data

SHEET **1** OF **2**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
		SAND, clayey, medium, brown.	Boring was grouted from total depth drilled to 2.5 feet below ground surfaces with a bentonite slurry .							
		SAND, silty, fine to coarse, with gravel, moist, brown.								60 %
		SAND, silty, trace clay, wet, brown, oxidized.								30 %
	10	SAND, fine to coarse, wet, rusty, brown, oxidation.								
		SAND, fine to medium, silty, light brown, oxidized.								
		SAND, coarse, and fine gravel, wet, light brown.								
		SILT, with fine sand, moist, gray.								
		SAND, fine to medium, wet, gray.								45 %
	20	SAND, fine, wet, gray.								
		SAND, fine to coarse, trace gravel, wet, gray.								35 %
	30	SAND, fine to coarse, trace gravel, wet, gray, with brown oxidation.								
		SAND, fine, wet, gray.								
		SILT, dense, gray, with iron streaks (black).								
		SAND, fine, brown.								
		SILT, clayey, moist, brown.								
		SAND, fine, wet, brown, with light brown, oxidation.								
	40	SAND, fine, wet, gray.								55 %
		SAND, fine, wet, gray, with brown oxidation.								
		SAND, fine to medium, wet, gray.								
		SAND, fine, with silt, gray, with brown oxidation.								90 %

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4" x 6" Rotosonic
Screened Interval (ft. bgs):	Not Applicable
Screen Size:	Not Applicable
Well Material:	Not Applicable
Grout Type:	Bentonite Slurry

REMARKS **Well not installed**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

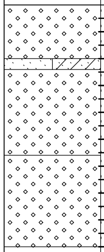
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **12/01/2012**

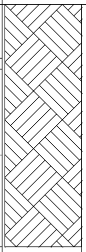
NORTHING: **2138263.64**
EASTING: **174384.21**
GROUND SURFACE ELEVATION (feet): **792.70**
TOP OF CASING ELEVATION (feet): **Not Applicable**
TOTAL DEPTH OF BORING (feet BGS): **60**

B87

Soil Sampling Data

SHEET **2** OF **2**





				SAMPLE INFORMATION						
					ANALYTICAL RESULTS (ug/L)					
STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
		SILT, dense, wet, gray. SILT, dense, with fine sand, iron streaks (black) gray. SAND, fine to coarse, wet, gray. *(continued)* SILT, clayey, moist, gray and light brown. SAND, fine to coarse, trace gravel, wet, brown. SAND, fine, wet, light brown.								70 %
	60									

CLIENT:	**Textron**	NORTHING:	**2138261.01**
PROJECT NAME:	**TORX Facility**	EASTING:	**174408.37**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**791.27**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**Not Applicable**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**50**
DATE DRILLED:	**12/01/2012**		

B88

Soil Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	CLAY, sandy, moist, brown.								
	SAND, clayey, mosit, brown.								
	SAND, fine to coarse, some gravel, moist, brown.								70 % 60 %
10	SAND, fine to coarse, some gravel, wet, brown.								
	SAND, fine to coarse, and GRAVEL, fine, wet, oxidized light brown.								
	SILT, wet, gray, upper oxidized light brown.								
	SAND, fine, some silt, dense, wet, gray.								
	SAND, fine, wet, gray.								45 %
20	SAND, medium to coarse, wet, gray.								
	SAND, fine, wet, gray.	Boring was grouted from total depth drilled to 2.5 feet below ground surfaces with a bentonite slurry .							
	SAND, fine to medium, trace gravel, wet, gray.								
	SAND, medium to coarse, some gravel, wet, gray.								
30	SAND, medium to coarse, some gravel, wet, gray, some brown oxidation.								40 %
	SAND, fine to medium, wet, gray.								
	Silt, with gravel, dense, gray, iron streaks.								
	SAND, fine, wet, light gray.								
	SILT, clayey, sand seams, dense, iron streaks, light gray.								
	SAND, fine, wet, light gray, some light red and brown.								
40	SAND, fine, wet, light gray, some brown, trace black.								75 % 45 %

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

Driler: Stearns Drilling
Method (type & size): 4" x 6" Rotosonic
Screened Interval (ft. bgs): Not Applicable

Screen Size: Not Applicable
Well Material: Not Applicable
Grout Type: Bentonite Slurry

REMARKS **Well not installed**

amec

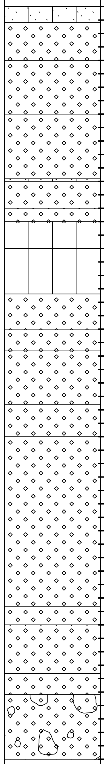
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138660.47**
PROJECT NAME:	**TORX Facility**	EASTING:	**173622.12**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.03**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**797.77**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**28**
DATE DRILLED:	**10/21/12**		

B89 / MW89

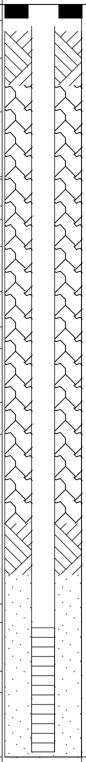
Soil Sampling Data

SHEET **1** OF **1**



DEPTH FEET	DESCRIPTION
	SILT and SAND, moist, black.
	SAND, fine, some silt, trace clay, moist, light brown.
	SAND, fine, some silt, trace gravel, trace clay, moist, light brown.
	SAND, fine, some silt, trace gravel, trace clay, moist, light brown.
	SILT, clayey, moist, black.
	SAND, fine to medium, some silt, moist, black.
10	SAND, with silt, wood debris, moist, black.
	SILT, trace clay, organic debris, moist, black.
	SILT, some fine sand, moist, black.
	SAND, fine to medium, some silt, trace gravel, moist, gray.
	SAND, fine to medium, some silt, trace clay, moist, gray.
	SAND, fine to medium, some silt, some clay, moist to wet, gray.
	SAND, very fine, some silt, wet, gray.
20	SAND, fine, trace silt, wet, gray.
	SAND, fine, some silt, wet, gray.
	SILT, some fine sand, wet, gray.
	SAND, fine, some silt, wet, gray.
	SAND and GRAVEL, wet, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	0852		6.2	2-2-3-4		100 %
☒	0854		6.1	3-3-2-2		85 %
☒	0900		6.2	1-1-2-1		80 %
☒	0908		21.4	2-2-2-3		95 %
☒	0912		24.6	1-2-3-5		90 %
☒	0915		9.1	4-4-5-5		100 %
☒	0924		4.5	3-4-3-3		95 %
☒	0928		4.6	3-3-3-5		100 %
☒	0943		4.4	2-3-4-2		100 %
☒			3.2	1		95 %
☒	0955		3	1-1-2-2		85 %
☒	1000		5.4	1-1-2-4		100 %
☒	1008		4.5	4-6-6-11		90 %
☒	1018		3.6	1-3-11-19		95 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	22.7-27.5
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS **MW89(28)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138617.88**
PROJECT NAME:	**TORX Facility**	EASTING:	**173599.09**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**795.87**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**795.55**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**26**
DATE DRILLED:	**10/21/12**		

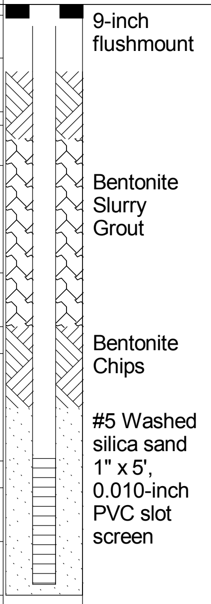
INJ-1

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
		SAND, fine to medium, trace organics, moist, black.
		SAND, fine to coarse, trace fines, moist, brown.
		SAND, fine to coarse, trace fine gravel, trace fines, moist, brown.
		SAND, fine to coarse, trace fines, moist, brown.
		SAND, fine to coarse, trace fines, trace clay, moist, gray.
	10	SAND, fine to coarse, trace fines, moist, gray.
		SAND, fine to medium, some silt, very moist, gray trace black staining.
		SAND, fine to medium, some silt, saturated, gray.
		SAND, fine to coarse, some clay, trace fine gravel, moist, gray.
		SAND, fine to coarse, some fine gravel, trace coarse gravel, saturated, gray.
	20	SAND, fine to coarse, with fine to coarse gravel, saturated, dark gray.
		SAND, fine to coarse, some fine gravel, trace coarse gravel, saturated, gray.
		SAND, fine to coarse, some fine gravel, saturated, gray.
		SILT and SAND, fine, saturated, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION						
	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	1435		3.7	1-1-2-1		80 %
	1442		3.5	1-2-2-2		65 %
	1445		1.2	3-5-8-9		60 %
	1459		1.9	5-4-2-2		80 %
	1504		2.4	0-1-1-2		50 %
	1510		66.4	3-5-6-8		65 %
	1515		372	3-3-2-3		65 %
	1522		867	0-1-1-2		45 %
	1525		1963	0-0-1-1		45 %
	1530		1862	0-0-0-1		60 %
	1534		131	0-2-2-3		70 %
	1540		62.5	1-1-3-4		50 %
	1544		5.2	2-4-8-11		45 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	16.9-21.6
Screen Size:	0.010 slot
Well Material:	1-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

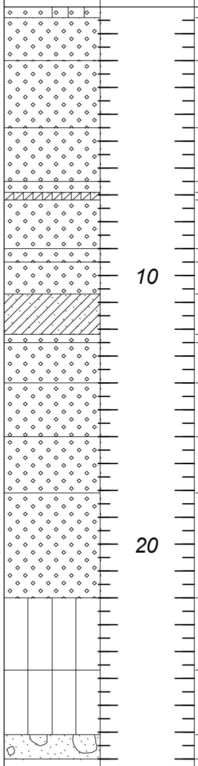
CLIENT:	**Textron**	NORTHING:	**2138627.39**
PROJECT NAME:	**TORX Facility**	EASTING:	**173626.56**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.68**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.42**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**28**
DATE DRILLED:	**10/21/12**		

INJ-2

Soil Sampling Data

SHEET **1** OF **1**

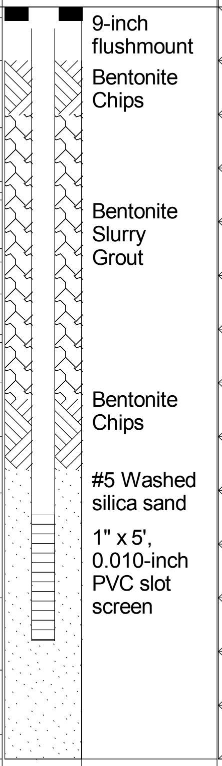
STRATA / DEPTH FEET



DESCRIPTION

- SILT and SAND, moist, black.
- SAND, fine, some silt, moist, light brown.
- SAND,fine, some silt, trace gravel, mosit, light brown.
- SAND, fine to medium, trace gravel, trace silts, moist, light brown.
- SAND, fine to medium, some gravel, trace silts, moist, light brown.
- CLAY, silty, some sand, organic debris (wood) oily, moist, black.
- SAND, fine, some silt, moist. light gray.
- SAND, fine, with silt, moist, black.
- SAND, fine, trace silt, trace gravel, moist, gray.
- CLAY, sandy, trace gravel, moist, gray, some brown.
- SAND, clayey, some organics (roots/limbs), oily, moist, dark gray.
- SAND, silty, oily, moist to wet, dark gray.
- SAND, silty, fine to coarse, some clay, wet, gray.
- SAND, silty, fine to coarse, trace clay, wet, gray.
- SAND, fine to medium, some silt, wet, gray.
- SILT, with fine sand, wet, gray.
- SILT, wet, gray.
- SAND and GRAVEL, silty, wet, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1434		1.8	1-1-2-3		90 %
☒	1438		2	2-2-1-1		90 %
☒	1443		2.6	2-1-2-1		85 %
☒	1450		2.2	2-2-4-5		95 %
☒	1455		1	3-3-3-4		100 %
☒	1500		1.6	3-3-3-3		100 %
☒	1505		41.3	2-4-4-4		100 %
☒	1508		2.2	1-1-1-1		100 %
☒	1510		1.3	1-1-1-2		70 %
☒	1520		273	1-2-3-4		95 %
☒	1523		342	2/24		95 %
☒	1530		120	1-1-1-1		95 %
☒	1534		27	1-1-1-2		100 %
☒	--		36	1-1-2-2		100 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	18.9-23.6
Screen Size:	0.010 slot
Well Material:	1-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

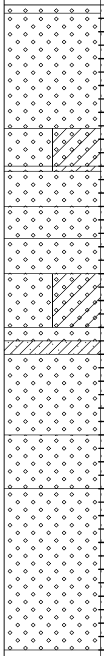
CLIENT:	**Textron**	NORTHING:	**2138609.77**
PROJECT NAME:	**TORX Facility**	EASTING:	**173628.3**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.93**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.61**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**24**
DATE DRILLED:	**10/22/12**		

INJ-3

Soil Sampling Data

SHEET **1** OF **1**

STRATA

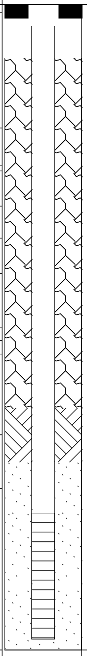


DEPTH FEET: 10, 20

DESCRIPTION

- SAND, fine to coarse, trace organics, moist, black.
- SAND, fine to coarse, trace fines, moist, brown.
- SAND, clayey, fine to coarse, trace fine gravel, moist, dark brown.
- SAND, clayey, fine to coarse, trace fine gravel, moist, gray.
- SAND, fine to coarse, trace fines, moist, brown.
- SAND, fine to coarse, trace silt, moist, grayish-black.
- SAND, fine to coarse, trace silt, trace clay, moist, gray.
- SAND, clayey, fine to coarse, some silt, moist, gray.
- SAND, fine to coarse, trace silt, saturated, gray.
- CLAY, sandy, fine to coarse, moist gray.
- SAND, fine to coarse, some clay, trace silt, saturated, gray.
- SAND, fine to coarse, trace silt, trace clay, saturated, gray/
- SAND, fine to coarse, trace silt, saturated, gray.

WELL CONSTRUCTION DETAIL



- 9-inch flushmount
- Bentonite Slurry Grout
- Bentonite Chips
- #5 Washed silica sand
- 1" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1305		2.7	1-2-2-3		60 %
☒	1307		3	2-2-2-2		50 %
☒	1310		2.7	1-2-2-3		50 %
☒	1316		2.3	1-2-3-3		90 %
☒	13226		6.7	1-1-1-2		65 %
☒	1334		6.4	2-4-5-6		85 %
☒	1534		37.2	2-3-3-4		80 %
☒	1538		7.6	1-1-1-2		75 %
☒	1545		4.4	0-1-1-0		85 %
☒	1549		37.1	0-0-1-2		85 %
☒	1553		85.6	1-0-0-1		50 %
☒	--		100.1	1-1-1-1		75 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	18.9-23.6
Screen Size:	0.010 slot
Well Material:	1-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

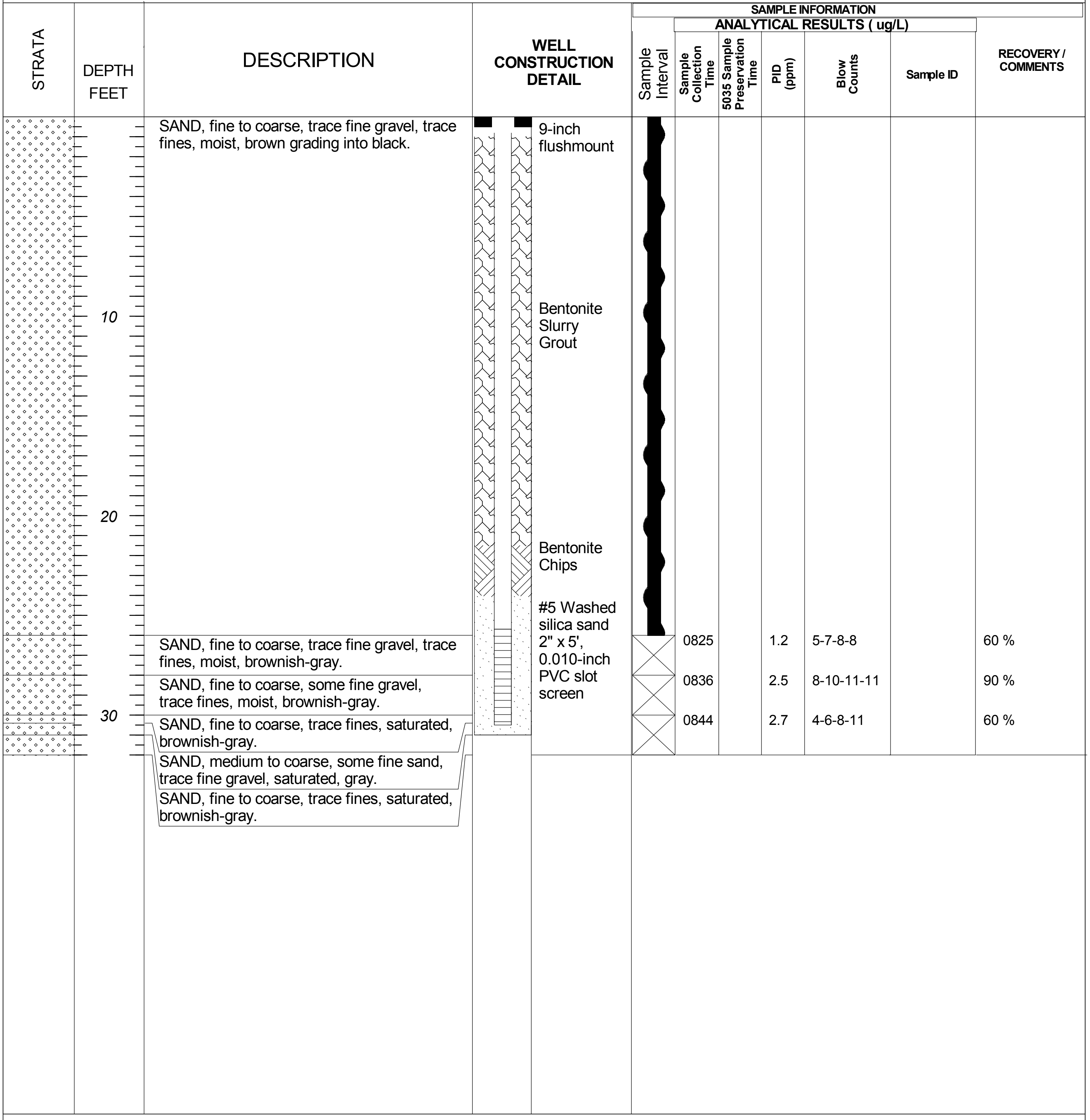
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/19/2012**

NORTHING: **2138535.38**
EASTING: **173592.79**
GROUND SURFACE ELEVATION (feet): **800.91**
TOP OF CASING ELEVATION (feet): **800.56**
TOTAL DEPTH OF BORING (feet BGS): **32**

OW3E

Soil Sampling Data

SHEET **1** OF **1**



DESCRIPTION

SAND, fine to coarse, trace fine gravel, trace fines, moist, brown grading into black.

SAND, fine to coarse, trace fine gravel, trace fines, moist, brownish-gray.

SAND, fine to coarse, some fine gravel, trace fines, moist, brownish-gray.

SAND, fine to coarse, trace fines, saturated, brownish-gray.

SAND, medium to coarse, some fine sand, trace fine gravel, saturated, gray.

SAND, fine to coarse, trace fines, saturated, brownish-gray.

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
0825		1.2	5-7-8-8		60 %
0836		2.5	8-10-11-11		90 %
0844		2.7	4-6-8-11		60 %

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 25.7-30.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

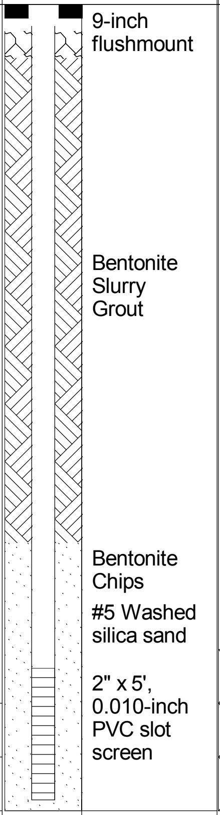
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/17/2012**

NORTHING: **2138538.58**
EASTING: **173589.78**
GROUND SURFACE ELEVATION (feet): **800.63**
TOP OF CASING ELEVATION (feet): **800.26**
TOTAL DEPTH OF BORING (feet BGS): **30**

OW3N

Soil Sampling Data

SHEET **1** OF **1**



DEPTH FEET: 10, 20, 30

DESCRIPTION	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.	1356		4.1	3-3-4-4		45 %
SAND, fine to coarse, trace fines, saturated, gray.	1403		3.3	4-5-4-5		35 %
SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.	1409		3.5	6-9-10-11		60 %

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	24.8-29.6
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

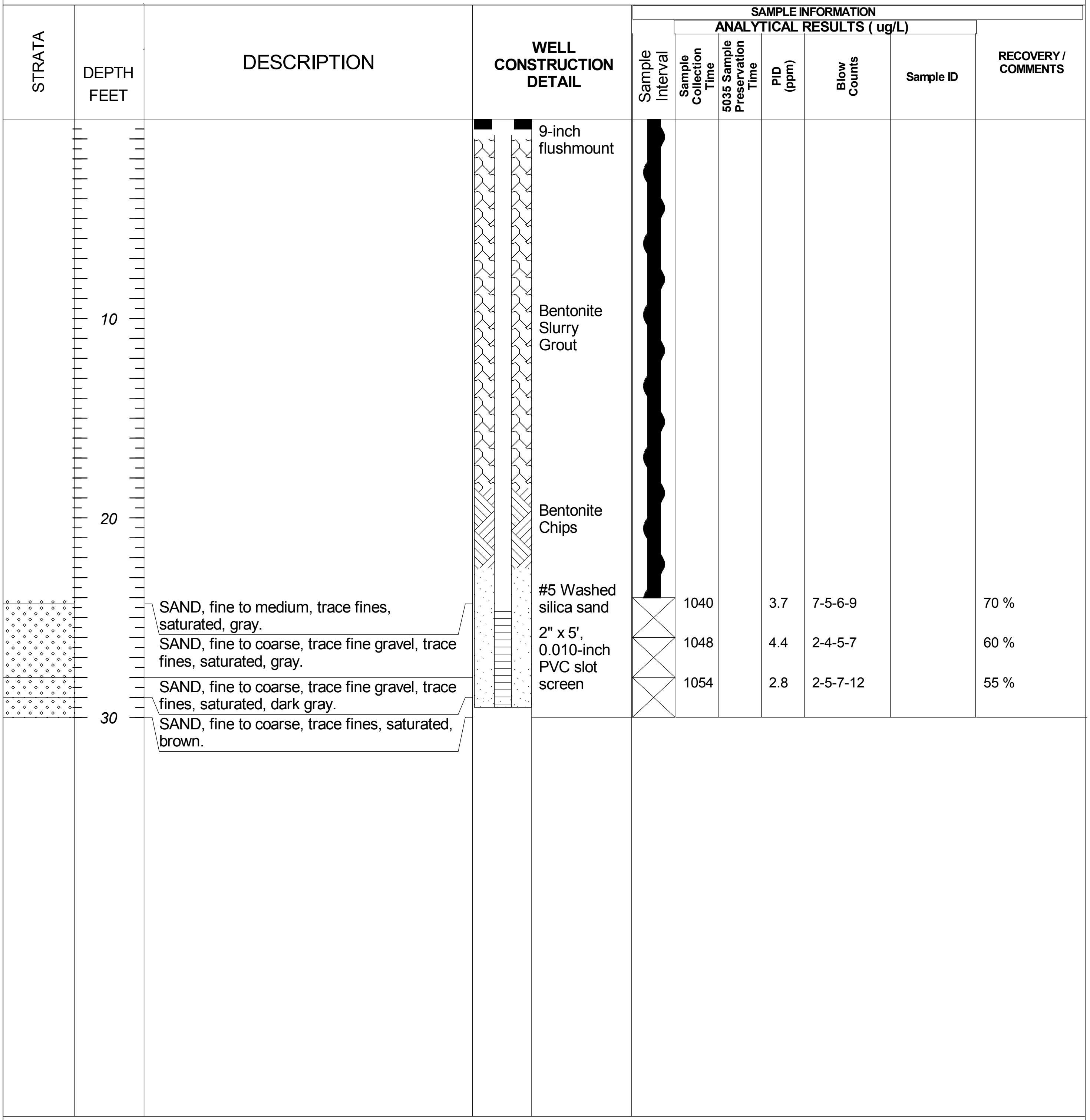
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138541.26**
PROJECT NAME:	**TORX Facility**	EASTING:	**173589.63**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**800.42**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**800.05**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**30**
DATE DRILLED:	**10/17/2012**		

OW6N

Soil Sampling Data

SHEET **1** OF **1**



DESCRIPTION
SAND, fine to medium, trace fines, saturated, gray.
SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
SAND, fine to coarse, trace fine gravel, trace fines, saturated, dark gray.
SAND, fine to coarse, trace fines, saturated, brown.

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	1040		3.7	7-5-6-9		70 %
	1048		4.4	2-4-5-7		60 %
	1054		2.8	2-5-7-12		55 %

ANALYTICAL RESULTS (ug/L)

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 24.7-29.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

amec

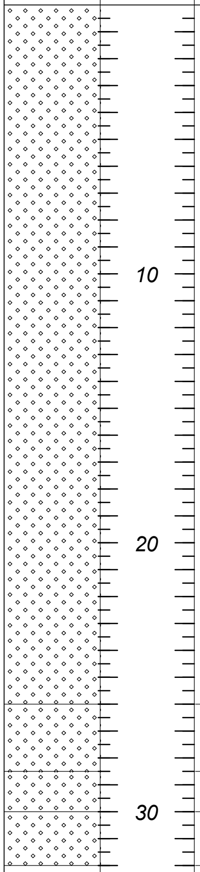
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138535.2**
PROJECT NAME:	**TORX Facility**	EASTING:	**173582.56**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**800.66**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**800.29**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**32**
DATE DRILLED:	**10/18/2012**		

OW6W

Soil Sampling Data

SHEET **1** OF **1**



DESCRIPTION

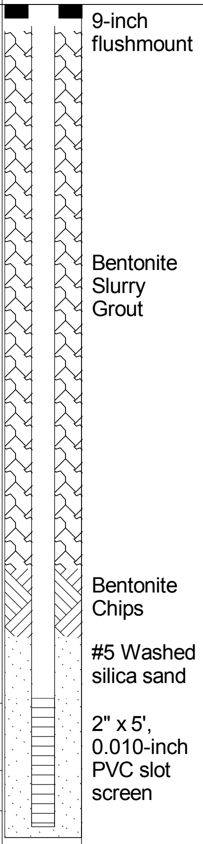
SAND, fine to coarse, some fines, trace gravel, moist, brown grading into gray.

SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.

SAND, fine to coarse, some fine gravel, trace fines, saturated, brownish-gray.

SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	ANALYTICAL RESULTS (ug/L)					
☒	1332		6.8	3-6-6-8		55 %
☒	1336		5.3	5-8-9-9		65 %
☒	1345		6.8	5-8-8-10		60 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	25.8-30.6
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138535.34**
PROJECT NAME:	**TORX Facility**	EASTING:	**173599.49**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**801.02**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**800.66**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**32**
DATE DRILLED:	**10/19/2012**		

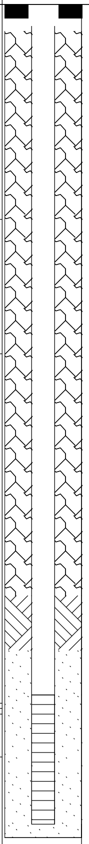
OW10E

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
		SAND, fine to coarse, trace fine gravel, trace fines, moist, brown.
	10	SAND, fine to coarse, trace fine gravel, trace fines, moist, dark gray.
	20	SAND, fine to coarse, trace fine gravel, trace fines, moist, brownish-gray.
		SAND, fine to coarse, some fine gravel, trace fines, saturated, gray.
		GRAVEL, medium, some coarse sand, trace fine to medium sand, saturated, gray.
	30	SAND, fine to coarse, trace fines, saturated, brownish-gray
		SAND, fine to coarse, some fine gravel, trace medium gravel, saturated, brownish-gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1107		2.1	3-5-8-9		60 %
☒	1112		2.8	5-10-14-14		80 %
☒	1118		2.2	3-4-8-9		60 %

ANALYTICAL RESULTS (ug/L)

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 25.7-30.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138535.15**
PROJECT NAME:	**TORX Facility**	EASTING:	**173605.17**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**801.20**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**800.87**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**32**
DATE DRILLED:	**10/19/12**		

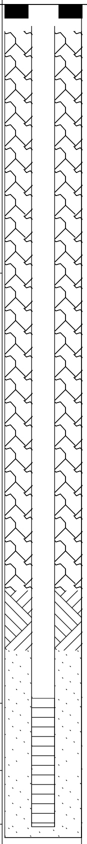
OW15E

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
	0	SAND, fine to coarse, trace fine gravel, moist, brown.
	10	SAND, fine to coarse, trace fine gravel, moist, gray.
	20	
		SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.
		SAND, fine to coarse, with fine to medium gravel, trace fines, saturated, brownish-gray.
	30	SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION							
	ANALYTICAL RESULTS (ug/L)						
Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1520		3.2	3-6-6-8		35 %
☒	1527		2.7	5-6-6-9		60 %
☒	1538		2.8	6-6-9-8		60 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	25.8-30.6
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

OW15N

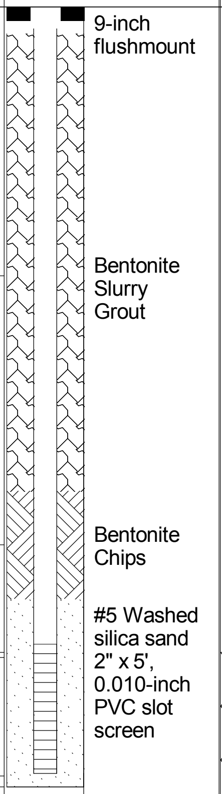
Soil Sampling Data

CLIENT:	**Textron**	NORTHING:	**2138550.47**
PROJECT NAME:	**TORX Facility**	EASTING:	**173589.23**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**799.83**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**799.49**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**30**
DATE DRILLED:	**10/17/2012**		

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION
0	SAND, fine to medium, moist, brownish-black.
10	SAND, fine to medium, moist, blackish-gray grading into gray.
20	SAND, fine to medium, moist, gray.
	SAND, fine to medium, trace fines, saturated, gray. SAND, fine to coarse, trace fine gravel, traces fines, saturated, gray.
30	SAND, fine to medium, trace fines, saturated, gray. SAND, fine to coarse, trace fine gravel, traces fines, saturated, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	0820		1.6	7-8-8-9		60 %
	0830		5.4	2-4-5-6		60 %
	0838		15.1	3-5-8-12		90 %

ANALYTICAL RESULTS (ug/L)

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 23.7-28.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

OW25E

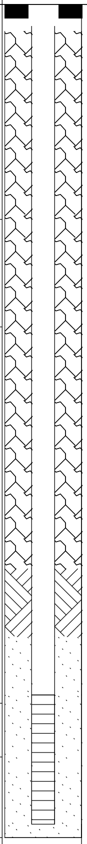
Soil Sampling Data

CLIENT:	**Textron**	NORTHING:	**2138535.26**
PROJECT NAME:	**TORX Facility**	EASTING:	**173614.63**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**801.54**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**801.12**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**32**
DATE DRILLED:	**10/20/12**		

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
		SAND, fine to coarse, trace fines, moist, brown.
	10	SAND, fine to coarse, trace fines, moist, brownish-gray.
	20	SAND, fine to coarse, trace fines, moist, brown.
		SAND, fine to coarse, trace fines, saturated, brownish-gray.
	30	SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
		SAND, fine to coarse, trace fines, saturated, brown.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION						
	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	0908		3.5	7-8-6-7		65 %
☒	0914		3.8	5-6-8-10		55 %
☒	0919		1.9	3-5-6-8		65 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	25.7-30.5
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

CLIENT:	**Textron**	NORTHING:	**2138560.07**
PROJECT NAME:	**TORX Facility**	EASTING:	**173589.29**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**799.17**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.83**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**30**
DATE DRILLED:	**10/16/2012**		

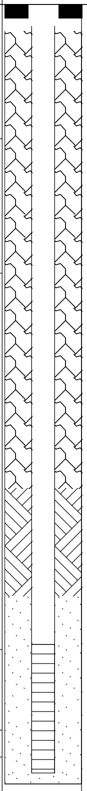
OW25N

Soil Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION
0–5	SAND, fine to medium, moist, brownish-black.
5–10	SAND, fine to medium, moist, blackish-gray.
10–24	SAND, fine to medium, moist, dark gray.
24–27	SILT and SAND, fine, trace clay, saturated, gray.
27–28	SAND, fine to coarse, trace fine gravel, saturated, gray.
28–30	SAND, fine to medium, trace coarse sand, saturated, gray.

WELL CONSTRUCTION DETAIL


9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Depth (feet)	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
24–26	1355		3.1	3-5-6-8		75 %
26–28	1409		4.9	2-5-6-6		75 %
28–30	1416		4.4	4-7-9-10		80 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	23.8-28.6
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/20/12**

NORTHING: **2138535.31**
EASTING: **173621.93**
GROUND SURFACE ELEVATION (feet): **801.73**
TOP OF CASING ELEVATION (feet): **801.45**
TOTAL DEPTH OF BORING (feet BGS): **32**

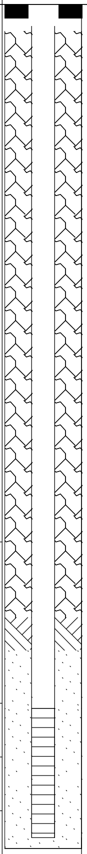
OW33E

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
		SAND, fine to coarse, trace fines, moist, brown.
	10	
	20	SAND, fine to coarse, trace fines, moist, gray.
		SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
		SAND, fine to coarse, some fine gravel, trace medium gravel, trace fines, saturated, brownish-gray.
	30	SAND, fine to coarse, some fine gravel, trace coarse gravel, trace fines, saturated, brownish-gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	1240		6.2	7-10-13-10		50 %
☒	1249		5.4	4-8-11-10		60 %
☒	1258		5	6-8-8-8		50 %

ANALYTICAL RESULTS (ug/L)

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 26.2-31.0

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

CLIENT:	**Textron**	NORTHING:	**2138618.36**
PROJECT NAME:	**TORX Facility**	EASTING:	**173612.47**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.40**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.06**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**26**
DATE DRILLED:	**10/22/12**		

PM-1

Soil Sampling Data

SHEET **1** OF **1**

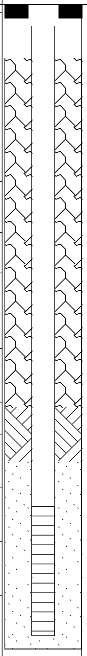
STRATA

DEPTH FEET: 10, 20

DESCRIPTION

- SAND, fine to coarse, trace gravel, trace fines, trace organics, moist, black.
- SAND, fine to coarse, trace fines, moist, brown.
- SAND, fine to coarse, trace fines, trace fine gravel, moist, gray.
- SAND, fine to coarse, some silt, trace clay, moist, gray.
- SILT and SAND, fine, trace clay, trace fine gravel, moist, gray.
- SAND, clayey, fine to coarse, trace fine gravel, moist, gray.
- SAND, fine to medium, some silt, saturated, gray.
- SAND, fine to medium, some silt, trace clay, saturated, gray trace black staining.
- SAND, fine to medium, with silt, saturated, gray.
- SAND, fine to coarse, with silt, saturated, gray.
- SAND, fine to coarse, trace silt, saturated, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
☒	0846		1.3	2-3-4-5		60 %
☒	0850		1.2	4-5-4-5		80 %
☒	0855		1.5	3-5-6-5		85 %
☒	0906		1.8	5-8-7-8		85 %
☒	0911		2.7	4-6-6-7		80 %
☒	0921		3	4-5-3-5		60 %
☒	0934		2.3	5-5-3-3		70 %
☒	0939		21.5	1-1-3-3		85 %
☒	0946		5.1	1-2-1-2		80 %
☒	--		120	1-0-0-1		90 %
☒	0957		383	0-1-0-1		70 %
☒	1004		222	0-0-1-2		80 %
☒	1011		85.6	1-1-1-2		60 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	18.7-23.5
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138618.95**
PROJECT NAME:	**TORX Facility**	EASTING:	**173627.22**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.72**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**798.45**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**24**
DATE DRILLED:	**11/04/12**		

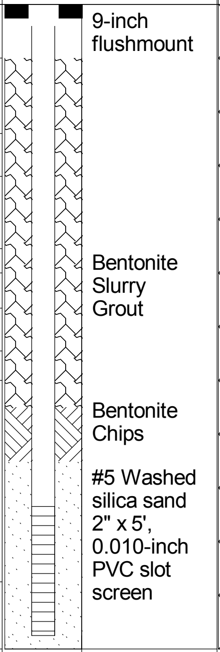
PM-2

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
		SAND, fine, silty, little medium to coarse sand and gravel, grass roots, moist, brown.
		SAND, fine to medium, trace gravel (black), trace coarse sand, trace silt, dry, brown.
		SAND, fine, silty, trace medium to coarse sand and gravel, black wood chips, dry, dark brown.
		SAND, fine, little silt, trace medium to coarse sand and gravel, dry, brown.
	10	SAND, fine, silty, trace clay, wood chip, moist, black.
		SAND, fine, little silt, trace medium to coarse sand, moist, gray.
		SAND, fine, silty, little clay, moist, gray.
		SAND, fine to medium, clayey, little coarse sand, some silt, moist to saturated, gray.
	20	SAND, fine to medium, little clay, silty, little coarse sand, trace gravel, saturated, dark gray.
		SAND, fine to coarse, silty, little clay, trace gravel, saturated, dark gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	1230		0.4	1-1-1-2		85 %
	1236		1.1	1-1-1-1		65 %
	1238		1.3	2-2-6-6		75 %
	1250		1.4	3-2-1-2		65 %
	1254		2.1	1-2-1-2		85 %
	1300		22.4	2-2-3-6		100 %
	1306		14.6	2-2-2-3		100 %
	1311		1.8	2-2-1-1		100 %
	1320		2.5	0-1-1-1		85 %
	1324		0.5	1-1-1-1		100 %
	1330		170	0-1-0-1		100 %
	1340		256	0-0-0-1		40 %

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	19.1-23.9
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138621.16**
PROJECT NAME:	**TORX Facility**	EASTING:	**173671.12**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**808.68**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**808.40**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**34**
DATE DRILLED:	**11/04-05/12**		

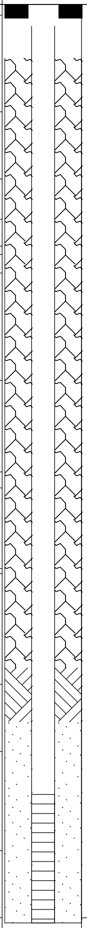
PM-3

Soil Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION
	SAND, fine, silty, organics, trace medium to coarse sand and gravel, mosit, dark gray.
	SAND, fine, silty, little medium to coarse sand, trace gravel, dry, brown.
	SAND, fine, silty, little medium to coarse sand, trace gravel, slightly moist, brown.
	SAND, fine, little silt, little medium to coarse sand, trace gravel, slightly moist, brown.
	SAND, fine, silty, little clay, moist, brown.
10	CLAY, sandy, fine, little silt, moist, brown.
	SAND, fine, silty, trace clay, wood chips, dark orange brown.
	SAND, fine, silty, trace medium to coarse sand and gravel, moist, light brown.
	SAND, fine, silty, trace medium to coarse sand, moist, light brown.
	SAND, fine to medium, trace coarse sand, trace silt, dry, gray-brown.
20	SAND, fine, little silt, trace medium to coarse sand, trace fine gravel, dry, light brown.
	SAND, fine, little silt, trace medium to coarse sand, trace fine gravel, moist, light brown.
	SAND, fine to medium, silty, trace coarse sand, trace gravel, moist, brown-gray.
	SAND, fine to medium, silty, trace coarse sand, trace gravel, saturated, brown-gray.
30	SAND, fine to medium, silty, little coarse sand, trace gravel, saturated, brown-gray.
	SILT, trace fine sand, saturate, brown-gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	1513		1.7			Hand Augered
☒	1540		2.1	1-1-1-1		75 %
☒	1551		2.3	1-1-1-1		75 %
☒	1557		1.9	1-1-2-2		70 %
☒	1603		1.4	1-3-1-1		90 %
☒	1611		2.1	1-1-2-3		70 %
☒	1615		1.5	2-3-2-3		100 %
☒	--		0.9	1-3-5-5		75 %
☒	0826		1.4	3-6-6-7		75 %
☒	0833		3.5	2-2-2-2		75 %
☒	0838		3.4	2-2-3-3		75 %
☒	0844		79.3	1-1-2-2		65 %
☒	0855		61.2	1-1-1-1		90 %
☒	0904		323	1-1-1-1		100 %
☒	0909		230	0-1-0-1		80 %
☒	0914		99.5	0-0-0-1		60 %

ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	29.4-34.2
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/18/2012**

NORTHING: **2138535.31**
EASTING: **173589.68**
GROUND SURFACE ELEVATION (feet): **800.81**
TOP OF CASING ELEVATION (feet): **800.47**
TOTAL DEPTH OF BORING (feet BGS): **32**

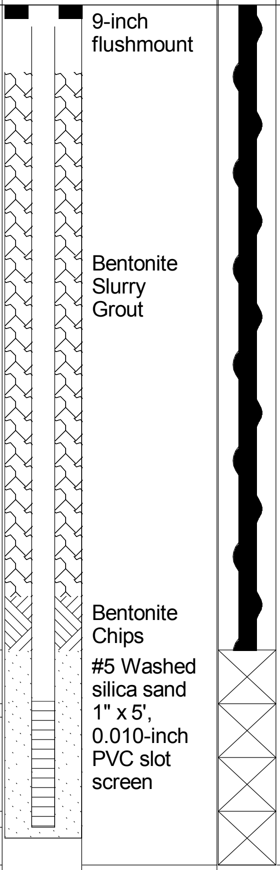
TIW

Soil Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION
	0	SAND, fine to coarse, trace fine gravel, moist, brown grading into gray.
	10	
	20	
		SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.
		SAND, fine to coarse, some fine gravel, trace fines, saturated, brownish-gray.
		SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.
	30	SAND, fine to coarse, some fine gravel, trace fines, saturated, brownish-gray.
		SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	0930		2.1	7-11-9-8		75 %
	0942		2.4	3-5-10-11		65 %
	0950		2.1	8-11-12-12		60 %
	0958		2.5	5-10-12-12		55 %

ANALYTICAL RESULTS (ug/L)

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 25.9-30.6

Screen Size: 0.010 slot
Well Material: 1-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - SOIL SAMPLE DATA TORX.GPJ 6/6/13

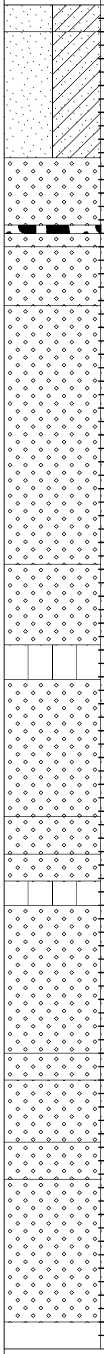
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **12/01/2012**

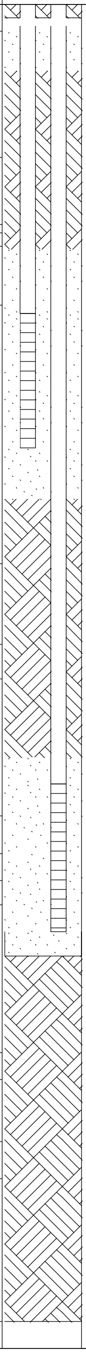
NORTHING: **2138263.38**
EASTING: **174423.14**
GROUND SURFACE ELEVATION (feet): **790.71**
TOP OF CASING ELEVATION (feet): **See Remarks**
TOTAL DEPTH OF BORING (feet BGS): **50**

ZVI-1

Soil Sampling Data

SHEET **1** OF **1**





DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
	SAND, clayey, moist, brown.								
	SAND, clayey, moist, light brown.	Flush mount protective casing. #5 Washed silica sand Bentonite Chips							90 %
	SAND, fine to coarse, some gravel, moist, gray.								
	GRAVEL, some sand, moist, brown.	#5 Washed silica sand							70 %
10	SAND, fine to medium, some coarse sand, some gravel.								
	SAND, fine to coarse, some gravel, silty, wet, light brown.	2" x 5', 0.010-inch PVC slot screen							
20	SAND, fine to medium, some coarse sand, trace gravel, wet, gray-brown.	Bentonite Chips							35 %
	SAND, fine, dense, some silt towards bottom, wet , gray,								
	SILT, dense, wet, gray.								
30	SAND, fine to coarse, trace gravel, wet, gray.	#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen							70 %
	SAND, fine to medium, trace gravel, wet, gray, stained brown.								
	SAND, fine to medium, trace gravel, wet, gray.								
	SILT, some fine sand, dense, gray, iron streaking.								
	SAND, fine dense, wet, light gray to light brown.	Bentonite Chips							
	SAND, fine, some silt, wet, gray.								80 %
40	SAND, fine, trace silt, trace gravel, wet, gray.								
	SAND, fine, wet, gray, with black.								
	SAND, fine, dense, wet, gray.								80 %

SAMPLE INFORMATION / ANALYTICAL RESULTS (ug/L)

Driller:	Stearns Drilling
Method (type & size):	4" x 6" Rotosonic
Screened Interval (ft. bgs):	12.0-17.0; 28.0-33.0
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite

REMARKS **ZVI1(16.5) = 790.28; ZVI1(34.5) = 790.26**

amec

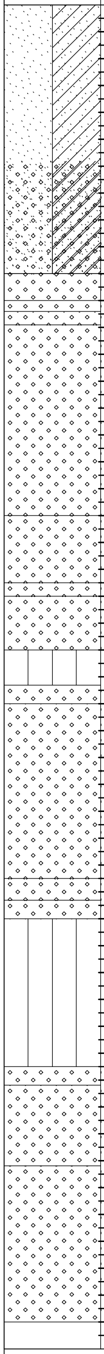
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

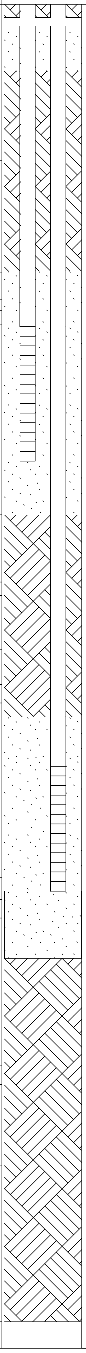
CLIENT:	**Textron**	NORTHING:	**2138251.45**
PROJECT NAME:	**TORX Facility**	EASTING:	**174423.11**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**791.40**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**See Remarks**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**50**
DATE DRILLED:	**12/01/2012**		

ZVI-2

Soil Sampling Data

SHEET **1** OF **1**





STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Sample Collection Time	5035 Sample Preservation Time	PID (ppm)	Blow Counts	Sample ID	RECOVERY / COMMENTS
		SAND, clayey, moist, brown.	Flush mount protective casing. #5 Washed silica sand Bentonite Chips							70 %
		SAND, fine to medium, some coarse sand, some gravel, moist, light brown.								70 %
	10	SAND, clayey, moist, light brown.	#5 Washed silica sand							
		SAND, fine to medium, cobbles, wet, black.								
		SAND, fine to coarse, trace silt, wet, light brown.	2" x 5', 0.010-inch PVC slot screen							
		SAND, fine to medium, coarse sand, some gravel, wet, brown.								
	20	SAND, fine to coarse, some gravel, wet, brown.								45 %
		SAND, coarse, some fine to medium, wet, light gray.	Bentonite Chips							
		SAND, fine, dense, wet, gray.								
		SILT, dense, wet, gray.								
		SAND, fine, dense, wet, gray.	#5 Washed silica sand							
	30	SAND, medium, some fine, some coarse, wet, gray.	2" x 5', 0.010-inch PVC slot screen							80 %
		SAND, medium, some fine, some coarse, wet, brown.								
		SAND, fine to medium, wet, gray.								
		SILT, dense, moist, gray, some iron streaks.	Bentonite Chips							80 %
	40	SAND, fine to medium, wet, gray.								
		SAND, fine, wet, gray.								
		SAND, fine, dense, wet, olive gray.								70 %

The SAMPLE INFORMATION header spans the columns from Sample Interval to RECOVERY / COMMENTS; ANALYTICAL RESULTS (ug/L) spans Sample Collection Time to Sample ID.

Driller:	Stearns Drilling
Method (type & size):	4" x 6" Rotosonic
Screened Interval (ft. bgs):	12.0-17.0; 28.0-33.0
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite

REMARKS **ZVI2(17.5) = 791.17 ; ZVI2(32.5) = 791.19**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

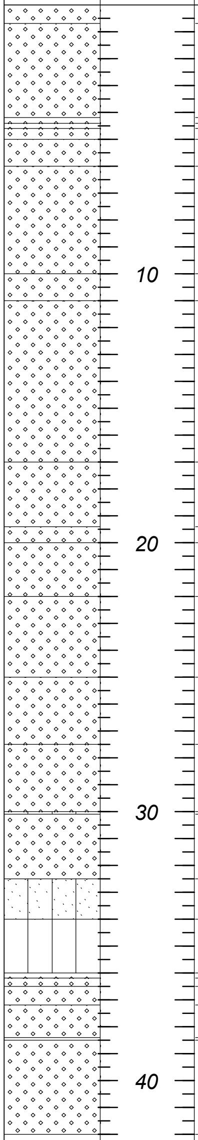
CLIENT:	**Textron**	NORTHING:	**2138615.45**
PROJECT NAME:	**TORX Facility**	EASTING:	**173732.94**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.76**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.28**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**42**
DATE DRILLED:	**10/17/12**		

B76 / MW76

Vertical Aquifer Sampling Data

SHEET **1** OF **1**

STRATA



DESCRIPTION

Concrete

SAND, fine, trace gravel, trace cobble, dry, light brown.

SAND, fine, trace clay, moist, brown

SAND, fine, trace gravel, trace cobble, dry, light brown.

SAND, fine, trace clay, moist, brown.

SAND, fine, trace gravel, trace cobble, dry, light brown.

SAND, fine, moist, light brown.

SAND, fine to coarse, some gravel, moist, light brown.

SAND, fine, moist, light brown.

SAND, fine,some gravel, moist, light brown.

SAND, fine, with gravel, moist, light brown, some gray and black.

SAND, fine to coarse, trace gravel, moist, brown.

SAND, medium to coarse, trace gravel, moist, brown.

SAND, medium to coarse, trace gravel, wet, brown.

SAND, medium to coarse, trace gravel, wet, gray.

SILT, wet.

SAND, medium to coarse, trace gravel, wet, gray.

SILT and SAND, fine, wet, gray.

SILT, with sand, wet, gray.

SAND, fine, wet, gray.

SAND, medium to coarse, wet, gray.

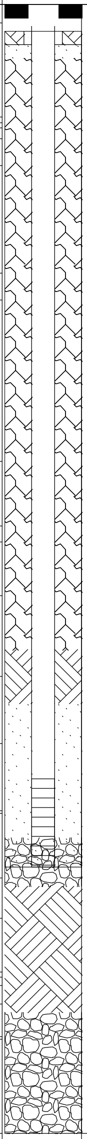
SAND, fine, with silt, wet, gray.

SAND, medium to coarse, wet, gray.

SAND, fine, wet, gray.

SAND, medium to coarse, trace gravel, wet, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
≈	1,500	<20	1,300	7.45	37-40	ATR-B76-G(37-40)

Driler:
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 28.8-31.2

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW76(30)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

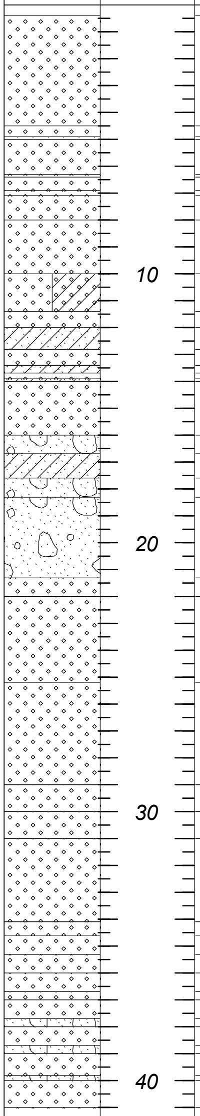
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **10/18/12**

NORTHING: **2138583.9**
EASTING: **173758.28**
GROUND SURFACE ELEVATION (feet): **809.76**
TOP OF CASING ELEVATION (feet): **809.39**
TOTAL DEPTH OF BORING (feet BGS): **41**

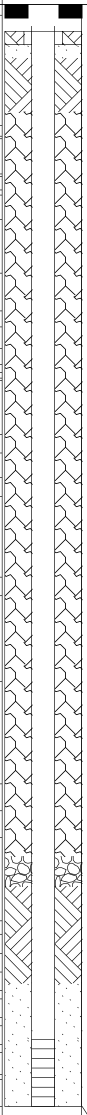
B77 / MW77
Vertical Aquifer Sampling Data

SHEET **1** OF **1**

STRATA | DEPTH FEET | DESCRIPTION | WELL CONSTRUCTION DETAIL



- CONCRETE
- SAND, fine, dry, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, dry, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, moist, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, moist, light brown.
- SAND, fine, trace clay, moist, brown.
- SAND, fine, trace clay, moist, light brown.
- SAND, fine, with interbedded clayey sand, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, trace gravel, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, fine, moist, brown.
- SAND, fine, moist, light brown.
- SAND, clayey, fine, moist, brown.
- SAND, fine, with interbedded clayey sand, moist, light brown.
- SAND and GRAVEL, trace clay, moist, dark brown.
- SAND, clayey, fine, moist, brown.
- SAND and GRAVEL, trace clay, moist, dark brown.
- SAND and GRAVEL, trace silt, trace clay, moist, dark brown.
- SAND, medium to coarse, moist, brown.
- SAND, fine to medium, trace silt, moist, light brown.
- SAND, fine to medium, wet, oily, gray.
- SAND, fine to coarse, wet, oily, gray.
- SAND, medium to coarse, wet, gray.
- SAND, fine, with silt, wet, oily, gray.
- SAND, fine to medium, wet, gray.
- SAND, very fine, with silt, wet, gray.
- SAND, fine to medium, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND, fine to coarse, with gravel, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, fine to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, medium to coarse, wet, gray.
- SAND and GRAVEL, wet, gray.
- SAND, medium to coarse, some gravel, wet, gray.



SAMPLE INFORMATION

Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	ANALYTICAL RESULTS (ug/L)					
	46,000	<200	255,000	2,000		ATR-B77-G(29-30)
	135	5.2	585	7.3		ATR-B77-G(39-40)

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 38.5-40.9

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW77(40)**

amec

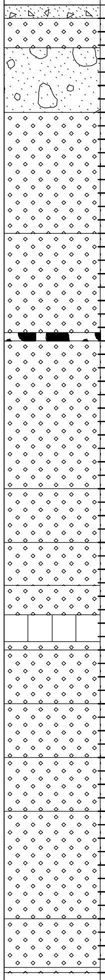
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138587.05**	
PROJECT NAME:	**TORX Facility**	EASTING:	**173807.85**	
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**809.70**	
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**809.30**	
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**36**	
DATE DRILLED:	**10/15-16/12**			

B78 / MW78

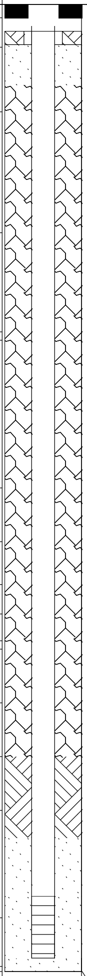
Vertical Aquifer Sampling Data

SHEET **1** OF **1**



DEPTH FEET	DESCRIPTION
	CONCRETE
	SAND, fine, some gravel and cobbles, dry, brown.
	SAND and GRAVEL, fine, some silt, dry, brown.
	SAND, fine, with fine gravel, dry, brown.
10	SAND, fine to coarse, some gravel, dry, brown.
	GRAVEL, fine, some sand, moist, brown.
	SAND, fine to medium, trace fine gravel, moist, light brown.
	SAND, fine to medium, moist, light brown to black.
20	SAND, fine to medium, trace gravel, moist, light brown, some black.
	SAND, fine to medium, moist, light brown to black.
	Silt, some fine sand, moist, brown.
	SAND, fine to medium, moist, light brown.
	SAND, fine to medium, trace gravel, wet, light brown.
	SAND, fine to medium, trace gravel, wet, gray.
30	SAND, fine to coarse, trace gravel, wet, gray.
	SAND, medium to coarse, trace gravel, wet, gray.
	SAND, medium to coarse, with gravel, wet, gray.
	SAND, fine to medium, with gravel, trace silt and clay, moist, gray.

WELL CONSTRUCTION DETAIL



9-inch flushmount

Bentonite Slurry Grout

Bentonite Chips

#5 Washed silica sand

2" x 2.5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	ANALYTICAL RESULTS (ug/L)					
	135	5.2	585	7.3		ATR-B77-G(39-40)

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 33.2-35.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW78(35)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

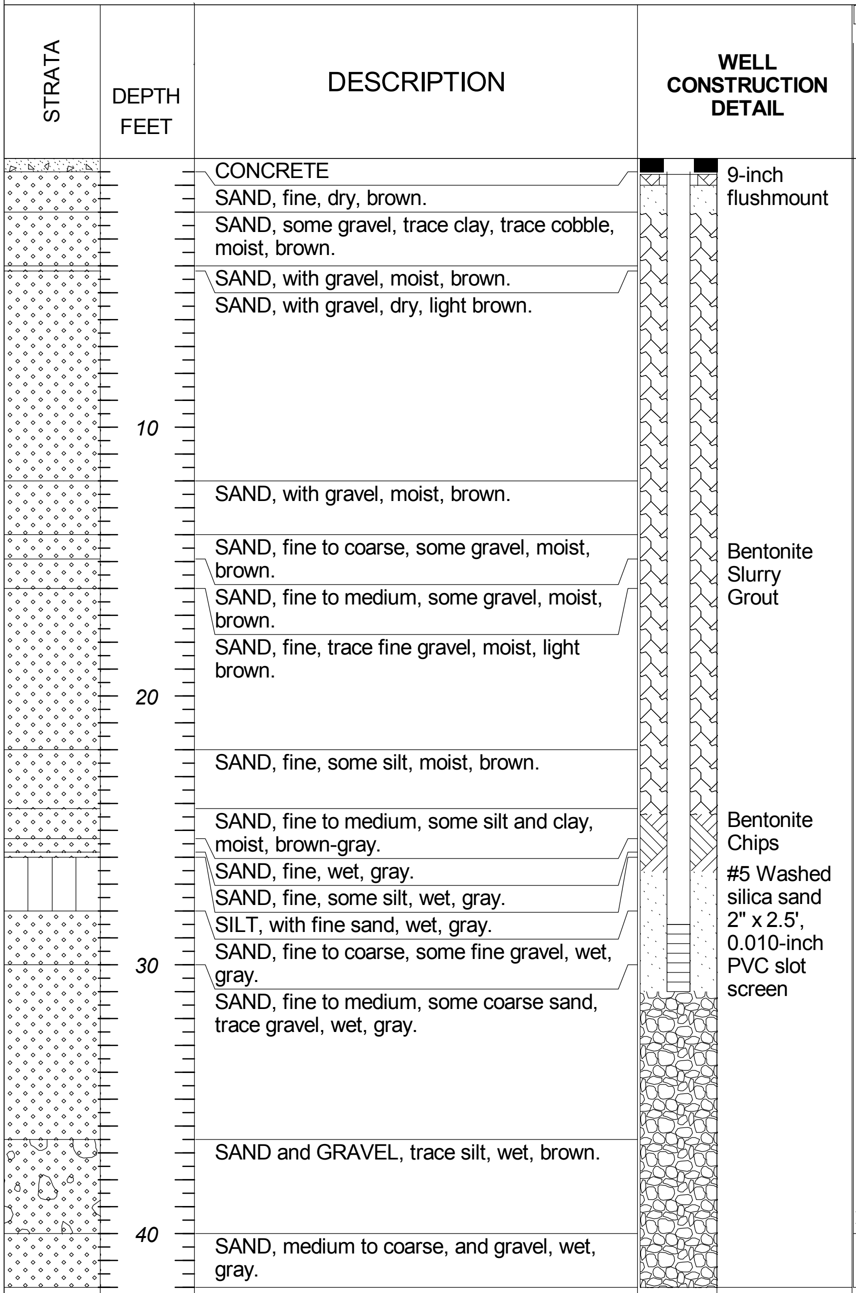
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Cherico**
DATE DRILLED: **10/19/12**

NORTHING: **2138539.75**
EASTING: **173767.19**
GROUND SURFACE ELEVATION (feet): **809.73**
TOP OF CASING ELEVATION (feet): **809.26**
TOTAL DEPTH OF BORING (feet BGS): **42**

B79 / MW79

Vertical Aquifer Sampling Data

SHEET **1** OF **1**



DESCRIPTION

CONCRETE
SAND, fine, dry, brown.
SAND, some gravel, trace clay, trace cobble, moist, brown.
SAND, with gravel, moist, brown.
SAND, with gravel, dry, light brown.
SAND, with gravel, moist, brown.
SAND, fine to coarse, some gravel, moist, brown.
SAND, fine to medium, some gravel, moist, brown.
SAND, fine, trace fine gravel, moist, light brown.
SAND, fine, some silt, moist, brown.
SAND, fine to medium, some silt and clay, moist, brown-gray.
SAND, fine, wet, gray.
SAND, fine, some silt, wet, gray.
SILT, with fine sand, wet, gray.
SAND, fine to coarse, some fine gravel, wet, gray.
SAND, fine to medium, some coarse sand, trace gravel, wet, gray.
SAND and GRAVEL, trace silt, wet, brown.
SAND, medium to coarse, and gravel, wet, gray.

SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	47	3.5	223	<2.0		ATR-B79-G(39-40)

Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 28.5-30.9

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW79(30)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/16/2012**

NORTHING: **2138591.63**
EASTING: **173578.4**
GROUND SURFACE ELEVATION (feet): **793.33**
TOP OF CASING ELEVATION (feet): **792.99**
TOTAL DEPTH OF BORING (feet BGS): **22**

B80 / MW80

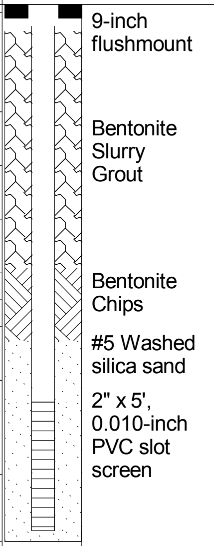
Vertical Aquifer Sampling Data

SHEET **1** OF **1**

STRATA

DEPTH FEET	DESCRIPTION
	SILT and SAND, fine to medium, organics, moist, brown.
	No Recovery.
	SAND, fine to medium, trace fine gravel, trace fines, moist, gray.
	SAND, fine to medium, trace fines, moist, gray.
	SAND, clayey, fine to medium, trace coarse sand, trace gravel, moist, gray.
10	CLAY, sandy, trace gravel, moist, gray.
	SAND, clayey, fine to medium, trace fine gravel, trace coarse sand, saturated, gray.
	SAND, fine to coarse, trace fine gravel, trace clay, saturated, gray.
	SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.
	SAND, fine, some silt, saturated, gray.
20	SILT and SAND, fine, saturated, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION						
	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 14.8-19.6

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW80(19)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **10/15/2012**

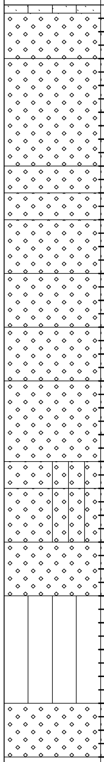
NORTHING: **2138636.03**
EASTING: **173625.89**
GROUND SURFACE ELEVATION (feet): **798.56**
TOP OF CASING ELEVATION (feet): **798.34**
TOTAL DEPTH OF BORING (feet BGS): **28**

B81 / MW81(27)

Vertical Aquifer Sampling Data

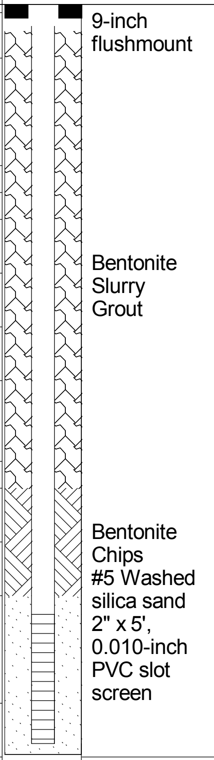
SHEET **1** OF **1**

STRATA



DEPTH FEET	DESCRIPTION
	SILT and SAND, fine to coarse, organics, moist, black.
	SAND, fine to medium, traces fines, trace clay, moist, brown to tan.
	SAND, fine to medium, trace fine gravel, trace coarse sand, trace silt, trace clay, moist, brown.
	SAND, fine to medium, trace fine gravel, trace coarse sand, moist, brown.
	SAND, fine to medium, trace fines, trace clay, moist, blackish-gray.
10	SAND, fine to medium, trace fines, trace clay, moist, dark-gray.
	SAND, fine to coarse, traces fines, moist, gray.
	SAND, medium to coarse, trace fines, trace clay, gray, moist. Oily feel to sediments.
	SAND, fine to coarse, trace fines, trace clay, saturated, gray.
	SILT and SAND, fine, trace fine gravel, saturated, gray.
20	SILT and SAND, fine, trace medium sand, saturated, gray.
	SAND, fine, some silt, trace medium sand, saturated, gray.
	SILT, trace fine sand, trace clay, saturated, gray
	SAND, fine to coarse, trace fine gravel, saturated, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	91	<20	54	<2.0	13-18	ATR-B81-G(13-18)101512

Driver: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 22.9-27.7

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW81(27)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138640.29**
PROJECT NAME:	**TORX Facility**	EASTING:	**173624.81**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.28**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**Not Applicable**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**50**
DATE DRILLED:	**10/20-21/2012**		

B81 OFFSET

Vertical Aquifer Sampling Data

SHEET **1** OF **1**

DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL
	See B81/MW81 Description for 0 to 10 feet below ground surface lithology.	
10	SAND, fine to coarse, trace fines, moist, gray.	
	SAND, fine to coarse, trace fines, trace clay, saturated, gray.	
	SAND and SILT, fine, saturated, gray.	
	SAND and SILT, fine to medium, saturated, gray.	
20	SAND, fine to medium, some silt, saturated, gray.	
	SILT and SAND, fine, saturated, gray.	Boring was grouted from total depth drilled to 2.5 feet below ground surfces with a bentonite slurry .
	SILT, trace fine sand, saturate, gray.	
	SILT and SAND, fine, saturated, gray.	
	SAND, fine to coarse, trace fine gravel, trace fines, saturated, gray.	
30	SAND, fine to coarse, trace fine gravel, trace fines, saturated, brownish-gray.	
	SAND, fine, some silt, saturated, brownish-gray.	
	SAND, fine to coarse, trace fine gravel, saturated, brownish-gray.	
	SILT, trace fine sand, saturated, brown.	
	SILT, trace fine sand, trace clay, saturated, brown.	
40	SILT, with fine sand, saturated, brown.	
	SILT, with fine sand, trace medium sand, saturated, brown.	
	CLAY, sandy, trace fine gravel, trace fine to coarse sand, stiff, moist, gray.	

SAMPLE INFORMATION

Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	ANALYTICAL RESULTS (ug/L)					
30-35	260	960	2,000	33	30-35	ATR-B81-G(30-35)102112

Driller:	Stearns Drilling
Method (type & size):	4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs):	Not Applicable
Screen Size:	Not Applicable
Well Material:	Not Applicable
Grout Type:	Bentonite Slurry

REMARKS **B81 OFFSET, Well not installed**

amec

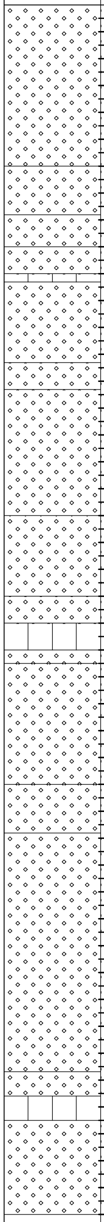
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

B81C / MW81(45)

Vertical Aquifer Sampling Data

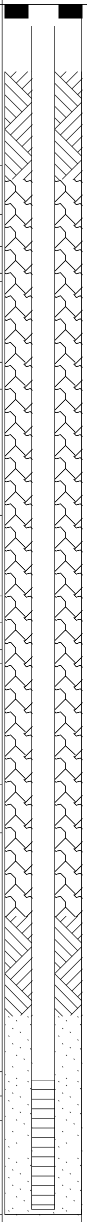
CLIENT:	**Textron**	NORTHING:	**2138634.91**
PROJECT NAME:	**TORX Facility**	EASTING:	**173619.66**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**798.14**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**797.68**
GEOLOGIST:	**R. Cherico**	TOTAL DEPTH OF BORING (feet BGS):	**50**
DATE DRILLED:	**12/03/12**		

SHEET **1** OF **1**



DEPTH FEET	DESCRIPTION
	SAND, fine to medium, light brown.
	SAND, fine, some silt, some clay, trace medium gravel, moist, gray.
	SAND, fine, some silt, trace gravel, moist, gray.
10	SAND, silty, fine, trace gravel, moist, gray.
	SILT, sand, organic material, oil odor, black.
	SAND, silty, some gravel, oil odor, moist to wet, gray.
	SAND, silty, some gravel, oil odor, wet, gray.
	SAND, fine, some silt, moist to wet, gray.
20	SAND, fine, some silt, wet, gray.
	SAND, fine, with silt, wet, gray.
	Silt, wet, gray.
	SAND, fine to coarse, some silt, wet, gray.
	SAND, fine, some silt, wet, gray.
30	SAND, fine to coarse, with gravel, some silt, wet, gray.
	SAND, fine, some medium to coarse sand, some gravel, wet, brown.
40	SAND, fine, with silt, wet, olive brown.
	SILT, dense, wet, dark brown.
	SAND, clayey, silty, moist, gray.

WELL CONSTRUCTION DETAIL



SAMPLE INFORMATION

	ANALYTICAL RESULTS (ug/L)					
Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	1,160	105	2,100	10	24-29	
	1,035	2,100	6,240	55	34-39	
	277	240	710	<200	40-45	

Driller:	Stearns Drilling
Method (type & size):	4" x 6" Rotosonic
Screened Interval (ft. bgs):	40.0-44.8
Screen Size:	0.010 slot
Well Material:	2-inch ID Schedule 40 PVC
Grout Type:	Bentonite

REMARKS **MW81(45)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

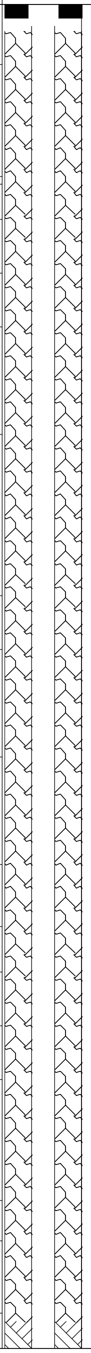
CLIENT:	**Textron**	NORTHING:	**2138574.35**
PROJECT NAME:	**TORX Facility**	EASTING:	**174009.43**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**807.73**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.38**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**58.7**
DATE DRILLED:	**10/29-30/2012**		

B82 / MW82

Vertical Aquifer Sampling Data

SHEET **1** OF **2**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL
		SAND, fine, grass and roots, trace silt, dry, brown.	9-inch flushmount
		SAND, fine, grass and roots, trace silt, dry, light brown.	
		SAND, fine, to gravel, trace silt, dry, red orange.	
		SAND, fine to coarse, little fine gravel, trace silt, dry, brown-gray.	
	10	SAND, fine, gravel, little silt, dry, brown.	
		SAND, fine to coarse, little gravel, trace silt, dry, brown gray.	
		SAND, medium to coarse, little fine sand, little fine gravel, trace silt, dry, brown.	
		SAND, fine to medium, little coarse sand, trace silt, trace gravel, dry, brown.	
	20		
		SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, dry, brown.	
		SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, saturated, brown.	Bentonite Slurry Grout
	30	SAND, medium, some fine sand, trace coarse sand, trace fine gravel, trace silt, saturated, gray.	
		SAND, fine to medium, little silt, little coarse sand, trace fine gravel, saturated, gray.	
		SAND, fine to coarse, little fine gravel, little silt, trace clay, saturated, gray.	
		SAND, fine to coarse, little silt, trace fine to medium gravel, saturated, gray.	
		SAND and GRAVEL, fine to coarse, little silt, little clay, saturated, gray.	
	40	SAND, fine to coarse, little gravel, little silt, little clay, saturated, gray.	
		SAND, fine to medium, some silt, little coarse sand, trace gravel, saturated, brown-gray.	
		SAND, fine to coarse, little silt, trace gravel, trace clay, saturated, brown-gray.	Bentonite



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	1,470	<200	13,182	<200	23-28	ATR-B82(23-28)-G102912
	5,480	<200	4,903	<200	33-38	ATR-B82(33-38)-G102912
	2,894	<200	4,879	<200	43-48	ATR-B82(43-48)-G103012

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 53.4-58.2

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW82(58)**

amec

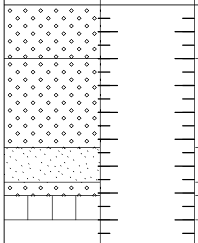
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

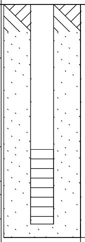
CLIENT:	**Textron**	NORTHING:	**2138574.35**
PROJECT NAME:	**TORX Facility**	EASTING:	**174009.43**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**807.73**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.38**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**58.7**
DATE DRILLED:	**10/29-30/2012**		

B82 / MW82

Vertical Aquifer Sampling Data

SHEET **2** OF **2**





DESCRIPTION	WELL CONSTRUCTION DETAIL	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
SAND, fine to medium, some coarse sand, some silt, trace clay, saturated, brown-gray. *(continued)*	Chips						
SAND, fine to medium, little silt, little coarse sand, trace fine gravel, saturated, brown-gray.	#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen	590	27	568	<20	53-58	ATR-B82(53-58)-G103012
SAND, fine, silty, saturated, brown-gray.							
SAND, fine to medium, little coarse sand, little silt, saturated, brown-gray.							
SILT, little clay, saturated, gray.							

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

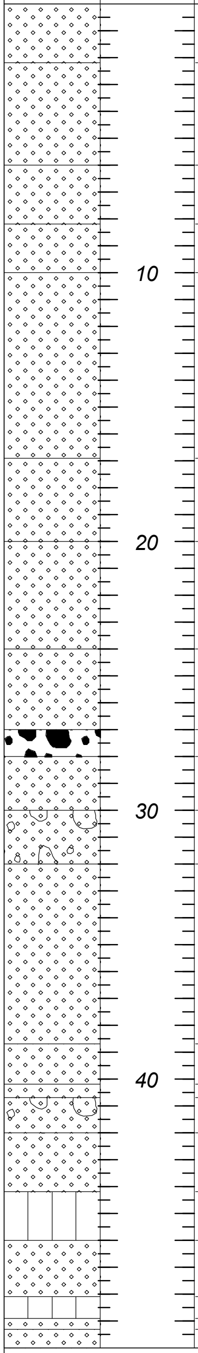
TEXTRON - WATER SAMPLE DATA TORX.GPJ 6/6/13

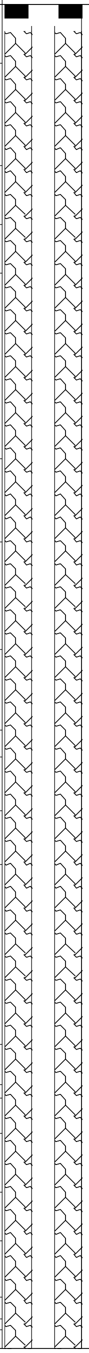
CLIENT:	**Textron**	NORTHING:	**2138484.61**
PROJECT NAME:	**TORX Facility**	EASTING:	**174040.64**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**808.11**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.67**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**64**
DATE DRILLED:	**10/31/12-11/01/12**		

B83 / MW83

Vertical Aquifer Sampling Data

SHEET **1** OF **2**





				SAMPLE INFORMATION					
				ANALYTICAL RESULTS (ug/L)					
DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	SAND, fine, silty, organics, moist.	9-inch flushmount							
	SAND, fine, silty, dry, light brown.								
	SAND, fine, silty, little clay, dry, light brown.								
	SAND, medium to coarse, clayey, little fine sand, very stiff, moist, brown.								
10	SAND, fine to coarse, trace silt, trace gravel, dry, brown.								
	SAND, fine to coarse, little gravel, trace silt, dry, brown.								
20	SAND, fine to medium, trace coarse sand, trace silt, dry, brown.								
	SAND, fine to medium, little silt, trace coarse sand, trace fine gravel, moist, brown.	Bentonite Slurry Grout							
	GRAVEL, some fine to medium sand, little silt, satruated, brown.								
30	SAND, fine to coarse, some silt, little fine gravel, trace medium gravel, saturated, brown-gray.								
	SAND and GRAVEL, fine to coarse, silty, saturated, brown-gray.								
	SAND, fine to coarse, silty, little fine gravel, trace medium gravel, saturated, gray.			305	<200	<200	<200	35-40	ATR-B83(35-40)-G103112
40	SAND, fine, silty, little medium sand, trace coarse sand, trace fine gravel, saturated, brown-gray.								
	SAND, fine, silty, trace medium sand, saturated, brown-gray.								
	SAND and GRAVEL, fine to coarse, silty, saturated, brown.								
	SAND, fine to coarse, little silt, little fine gravel, trace medium gravel, saturated, brown-gray.								
	SILT, saturated, brown to gray.								
	SAND, fine, silty, saturated, brown.			36	<20	<20	<20	49-54	ATR-B83(49-54)-

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 59.2-64.0

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW83(64)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138484.61**
PROJECT NAME:	**TORX Facility**	EASTING:	**174040.64**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**808.11**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**807.67**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**64**
DATE DRILLED:	**10/31/12-11/01/12**		

B83 / MW83

Vertical Aquifer Sampling Data

SHEET **2** OF **2**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	SAMPLE INFORMATION Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
		SILT, clayey, little fine sand, saturated, gray.								G103112
		SAND, fine to medium, silty, trace coarse sand, trace fine gravel, saturated, brown.								
		SAND, fine to medium, trace coarse sand, trace fine gravel, little silt, saturated, brown-gray. *(continued)*	Bentonite Chips							
		SAND, fine to coarse, silty, little gravel, little clay, saturated, brown-gray.								
		SAND, fine to medium, trace coarse sand, trace gravel, little silt, saturated, brown-gray.	#5 Washed silica sand		<2.0	<2.0	<2.0	<2.0	59-64	ATR-B83(59-64)-G103112
	60	SAND, silty, saturated, brown.	2" x 5', 0.010-inch PVC slot screen							
		SILT, sandy, fine, saturated, brown.								
		SAND, fine to medium, little silt, saturated, brown-gray.								

CLIENT:	**Textron**	NORTHING:	**2138350.48**
PROJECT NAME:	**TORX Facility**	EASTING:	**174151.56**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**822.46**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**824.91**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**44**
DATE DRILLED:	**11/04/2012**		

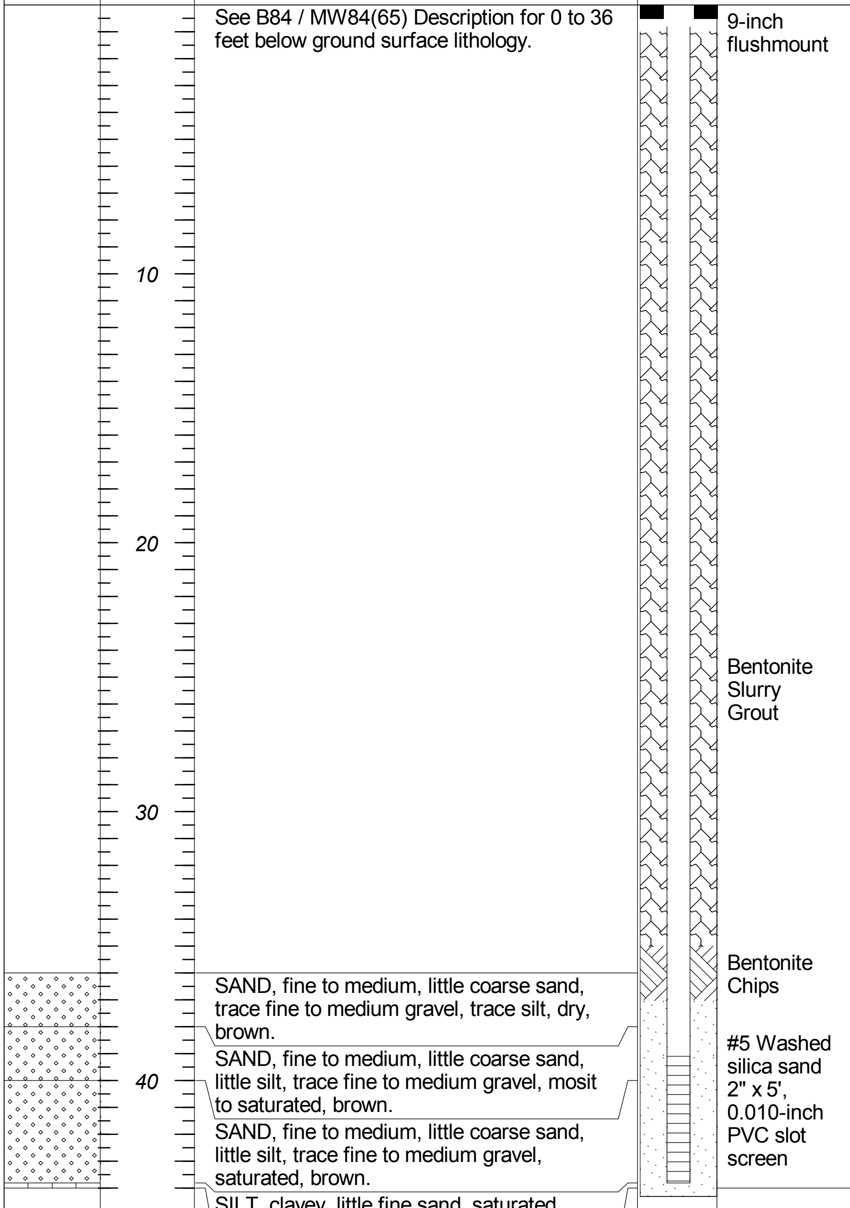
B84 / MW84(44)

Vertical Aquifer Sampling Data

SHEET **1** OF **1**

STRATA	DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	0–36	See B84 / MW84(65) Description for 0 to 36 feet below ground surface lithology.								
	36–38.7	SAND, fine to medium, little coarse sand, trace fine to medium gravel, trace silt, dry, brown.								
	38.7–41.4	SAND, fine to medium, little coarse sand, little silt, trace fine to medium gravel, mosit to saturated, brown.								
	41.4–44	SAND, fine to medium, little coarse sand, little silt, trace fine to medium gravel, saturated, brown.								
	44	SILT, clayey, little fine sand, saturated, brown.								

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)



Driler: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 39.1-43.8

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW84(44)**

amec

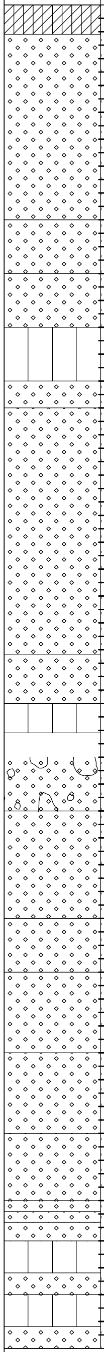
AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

CLIENT:	**Textron**	NORTHING:	**2138354.76**
PROJECT NAME:	**TORX Facility**	EASTING:	**174151.41**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**822.31**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**824.56**
GEOLOGIST:	**D. Gross**	TOTAL DEPTH OF BORING (feet BGS):	**76**
DATE DRILLED:	**11/03/12**		

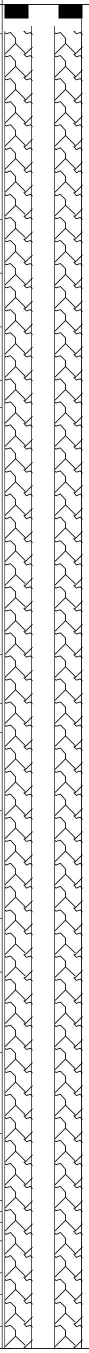
B84 / MW84(65)

Vertical Aquifer Sampling Data

SHEET **1** OF **2**



DESCRIPTION
CLAY, silty, some fine to coarse sand and gravel, moist, dark brown to brown.
SAND, fine to coarse, silty, fine gravel, littel medium gravel, dry, light-brown.
SAND, fine, little silt, dry, light brown.
SAND, fine, some silt, dry, light brown.
SILT, sandy, fine, dry, brown.
SAND, fine, silty, dry, brown.
SAND, fine to medium, dry, brown-gray.
SAND, fine, silty, dry, brown.
SILT, moist, brown.
SAND and GRAVEL, fine to coarse, little silt, moist, brown-gray.
SAND, fine to coarse, little fine gravel, little silt, trace medium gravel, trace clay,dry, brown.
SAND, fine to medium, little coarse sand, trace fine to medium gravel, trace silt, trace clay, dry, brown.
SAND, fine to coarse, little coarse sand, trace fine to medium gravel, trace silt, trace clay, dry, brown.
SAND, fine to coarse, little coarse sand, trace fine to medium gravel, little silt, trace clay, saturated, brown.
SAND, fine to medium, trace coarse sand and garvel, little silt, saturated, brown.
SAND, fine, silty, saturated, brown.
SAND, fine, little clay, silty, saturated, brown.
SILT, clayey, little fine sand, saturated, brown.
SILT, sandy, fine, little clay, saturated, brown.



SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	<2.0	11.9	<2.0	<2.0	39-44	ATR-B84(39-44)-G110212

Driller: Stearns Drilling
Method (type & size): 4 1/4" slotted hollow stem auger
Screened Interval (ft. bgs): 60.7-65.5

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite Slurry

REMARKS **MW84(65)**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

TEXTRON - WATER SAMPLE DATA TORX.GPJ 6/6/13

CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **D. Gross**
DATE DRILLED: **11/03/12**

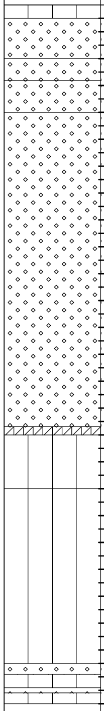
NORTHING: **2138354.76**
EASTING: **174151.41**
GROUND SURFACE ELEVATION (feet): **822.31**
TOP OF CASING ELEVATION (feet): **824.56**
TOTAL DEPTH OF BORING (feet BGS): **76**

B84 / MW84(65)

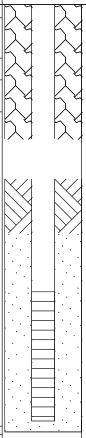
Vertical Aquifer Sampling Data

SHEET **2** OF **2**

STRATA | DEPTH FEET | DESCRIPTION | WELL CONSTRUCTION DETAIL



DEPTH FEET	DESCRIPTION
	SAND, fine, silty, little clay, saturated, brown-gray.
	SILT, sandy, fine, little clay, saturated, brown.
	SAND, fine, silty, little clay, saturated, brown.
	SILT, clayey, little fine sand, saturated, brown.
	SAND, fine, little silt, saturated, brown-gray.
	SAND, fine to medium, trace silt, saturated, brown-gray.
60	SAND, fine, little silt, saturated, brown.
	SAND, fine, trace medium to coarse sand, trace silt, saturated, brown.
	CLAY, silty, some fine to medium sand, little coarse sand, little fine gravel, moist, brown-gray.
	SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.
70	SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, lenses of fine sand, moist, gray.
	SAND, medium to coarse, silty, gray.
	SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.
	SAND, medium to coarse, silty, gray.
	SILT, clayey, some fine to medium sand, little coarse sand, trace gravel, moist, gray.



Bentonite Chips

#5 Washed silica sand
2" x 5', 0.010-inch PVC slot screen

SAMPLE INFORMATION

Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	ANALYTICAL RESULTS (ug/L)					
	4.9	12.8	7.8	<2.0	50-55	ATR-B84(50-55)-G110212
	<2.0	<2.0	<2.0	<2.0	60-65	ATR-B84(60-65)-G110212
	<2.0	<2.0	<2.0	<2.0	70-75	ATR-B84(70-75)-G110312

CLIENT:	**Textron**	NORTHING:	**2138920.12**
PROJECT NAME:	**TORX Facility**	EASTING:	**174779.44**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**797.03**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**See Remarks**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**150**
DATE DRILLED:	**11/27-30/12**		

B85 / MW85

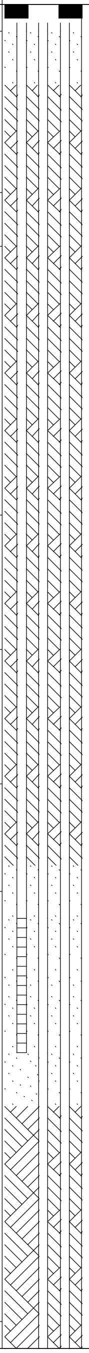
Vertical Aquifer Sampling Data

SHEET **1** OF **3**

STRATA | DEPTH FEET | DESCRIPTION | WELL CONSTRUCTION DETAIL

10 20 30 40

- Clay, silty, sandy, sand fine to coarse, trace fine gravel, moist, brown.
- SAND, fine to coarse, trace fine gravel, moist, brown.
- SAND, fine to medium, trace fine gravel, moist, brown.
- SAND, fine to medium, some silt, trace coarse sand, mosit, brown.
- SAND, fine, some silt, moist, brown.
- SAND, fine to medium, trace coarse sand, trace fine gravel, saturated, brown.
- SAND, fine to medium, trace coarse sand, trace silt, saturated, brown.
- SAND, fine, trace silt, saturated, brown.



14-inch flushmount

Bentonite Chips

#5 Washed silica sand 2" x 5', 0.010-inch PVC slot screen

Bentonite Chips

SAMPLE INFORMATION

Sample Interval	ANALYTICAL RESULTS (ug/L) Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	<1.0	<1.0	<1.0	<1.0	34-39	ATR-B85-G(34-39)112712
	<1.0	<1.0	<1.0	<1.0	44-49	ATR-B85-G(44-49)112812
	<1.0	<1.0	<1.0	<1.0		ATR-B85-G(44-49)112812R

Driller: Stearns Drilling
Method (type & size): 4" x 6" Rotosonic
Screened Interval (ft. bgs): 34-39; 64-69; 124-129

Screen Size: 0.010 slot
Well Material: 2-inch ID Schedule 40 PVC
Grout Type: Bentonite

REMARKS **MW85(39) =796.49 ; MW85(70) = 796.44; MW85(130) = 796.46**

amec

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio Office: (937) 859-3600

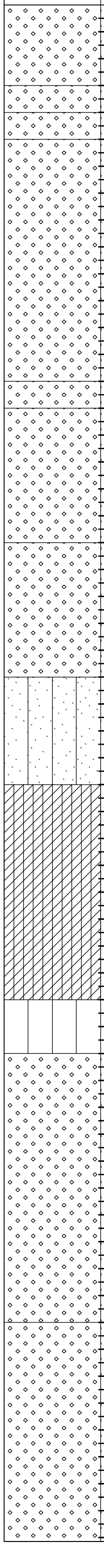
CLIENT: **Textron**
PROJECT NAME: **TORX Facility**
LOCATION: **Rochester, Indiana**
PROJECT NO: **3359-12-2618**
GEOLOGIST: **R. Dornbusch**
DATE DRILLED: **11/27-30/12**

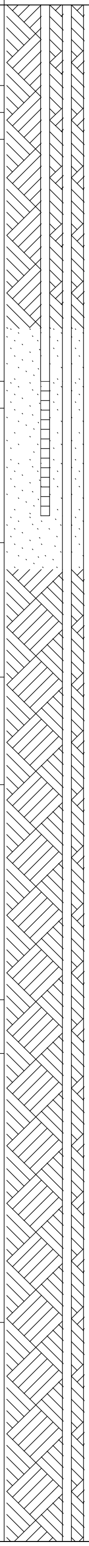
NORTHING: **2138920.12**
EASTING: **174779.44**
GROUND SURFACE ELEVATION (feet): **797.03**
TOP OF CASING ELEVATION (feet): **See Remarks**
TOTAL DEPTH OF BORING (feet BGS): **150**

B85 / MW85

Vertical Aquifer Sampling Data

SHEET **2** OF **3**





DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
	SAND, fine to medium, trace silt, saturated, grayish-brown. *(continued)*							
	SAND, fine, some silt, saturated, grayish-brown.		<1.0	<1.0	<1.0	<1.0	54-59	ATR-B85-G(54-59)1128912
	SAND, fine, some silt, saturated, gray.							
60	SAND, fine to medium, trace silt, saturated, brown.	#5 Washed silica sand						
	SAND, medium, saturated, orange-brown.	2" x 5', 0.010-inch PVC slot screen	<1.0	<1.0	<1.0	<1.0	64-69	ATR-B85-G(64-69)112812
	SAND, fine to medium, trace silt, saturated, gray.							
70	SAND, fine, some silt, trace clay, saturated, gray.							
	SILT and SAND, fine, some clay, saturated, gray.							
80	CLAY, silty, sandy, interbedded fine to medium sand, trace coarse sand, trace fine gravel, moist, gray.							
	SILT, some clay, trace fine sand, trace coarse sand, saturated, gray.							
90	SAND, fine to medium, trace coarse sand, trace silt, saturated, gray.	Bentonite Chips	<1.0	<1.0	<1.0	<1.0	94-99	ATR-B85-G(94-99)112812
100	SAND, fine to medium, trace silt, trace fine gravel, saturated, gray.							

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

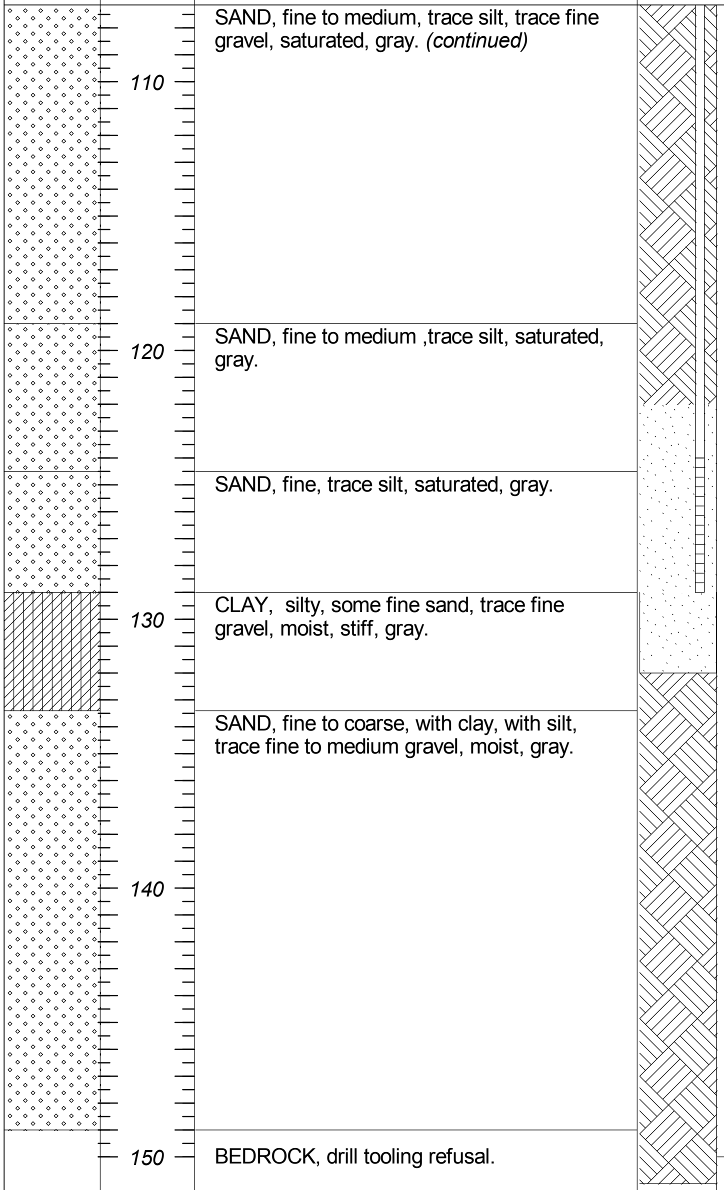
TEXTRON - WATER SAMPLE DATA TORX.GPJ 6/6/13

CLIENT:	**Textron**	NORTHING:	**2138920.12**
PROJECT NAME:	**TORX Facility**	EASTING:	**174779.44**
LOCATION:	**Rochester, Indiana**	GROUND SURFACE ELEVATION (feet):	**797.03**
PROJECT NO:	**3359-12-2618**	TOP OF CASING ELEVATION (feet):	**See Remarks**
GEOLOGIST:	**R. Dornbusch**	TOTAL DEPTH OF BORING (feet BGS):	**150**
DATE DRILLED:	**11/27-30/12**		

B85 / MW85

Vertical Aquifer Sampling Data

SHEET **3** OF **3**



STRATA / DEPTH FEET	DESCRIPTION	WELL CONSTRUCTION DETAIL	Sample Interval	Vinyl Chloride	TCE	Cis 1,2-DCE	Trans 1,2-DCE	Sample Interval	Sample ID
110	SAND, fine to medium, trace silt, trace fine gravel, saturated, gray. *(continued)*			<1.0	<1.0	<1.0	<1.0	114-119	ATR-B85-G(114-119)112912
120	SAND, fine to medium ,trace silt, saturated, gray.	#5 Washed silica sand							
	SAND, fine, trace silt, saturated, gray.	2" x 5', 0.010-inch PVC slot screen		<1.0	<1.0	<1.0	<1.0	124-129	ATR-B85-G(124-129)112912
130	CLAY, silty, some fine sand, trace fine gravel, moist, stiff, gray.								
140	SAND, fine to coarse, with clay, with silt, trace fine to medium gravel, moist, gray.	Bentonite Chips							
150	BEDROCK, drill tooling refusal.								

SAMPLE INFORMATION — ANALYTICAL RESULTS (ug/L)

APPENDIX F

LABORATORY REPORTS FOR SOIL AND GROUNDWATER SAMPLES

Appendix F

Table of Contents for Laboratory Analytical Data Reports

SDG#(1)	Sample Collection Date	Sample Type	Location Name	Sampling/Monitoring Event	Laboratory	Lab Report Link	Level IV Data Packages	Data Validation Report Location
1209829	9/27/2012	GW	Monitoring Wells	September 2012 Baseline	ALS	Analytical Report	Data Package	Data Validation Report
6768	9/27/2012	GW	Monitoring Wells	September 2012 Baseline	Microseeps	Analytical Report	NA	NA
071JI	9/27/2012	GW	Monitoring Wells	September 2012 Baseline	Microbial Insights	Analytical Report	NA	NA
1211132	11/5/2012	GW	Monitoring Wells	November 2012 Baseline	ALS	Analytical Report	Data Package	Data Validation Report
013JK	11/5/2012	GW	Monitoring Wells	November 2012 Baseline	Microseeps	Analytical Report	NA	NA
7214	11/5/2012	GW	Monitoring Wells	November 2012 Baseline	Microbial Insights	Analytical Report	NA	NA
1210694	10/18/2012	GW	B77(39-40) & B76(37-40)	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1210808	10/23/2012	GW	B79(39-40) & B81(30-35)	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1211133	10/29/2012	QA/QC	Mobile GC(3) QA/QC Sample	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	NA
1211135	11/2/2012	Soil	Roll Off Box	2012 Pilot Study Investigation Waste Characterization	ALS	Analytical Report	NA	NA
1211155	11/5/2012	GW	Soil Borings B82, B83, & B84	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1211922	11/28/2012	GW	INJ1	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1211925	11/29/2012	GW	Soil Boring B85	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1212181	12/5/2012	GW	Soil Boring B81(34-39) & MW81(45)	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1212182	12/2/2012	Soil	ZVI Borings B87 & B88	2012 Pilot Study Investigation	ALS	Analytical Report	Data Package	Data Validation Report
1212693	12/18/2012	GW	Monitoring Wells	December 2012 Performance	ALS	Analytical Report	Data Package	Data Validation Report
7655	12/18/2012	GW	Monitoring Wells	December 2012 Performance	Microseeps	Analytical Report	None	NA
061JL	12/18/2012	GW	Monitoring Wells	December 2012 Performance	Microbial Insights	Analytical Report	None	NA
1301234	1/8/2013	GW	Monitoring Wells	January 2013 Performance	ALS	Analytical Report	Data Package	Data Validation Report
1302167	2/4/2013	GW	MW80(27)	MW80(27) Monitoring	ALS	Analytical Report	Data Package	Data Validation Report
1302168	2/4/2013	GW	Monitoring Wells	February 2013 Performance	ALS	Analytical Report	Data Package	Data Validation Report
8017	2/4/2013	GW	Monitoring Wells	February 2013 Performance	Microseeps	Analytical Report	NA	NA
1303178	3/6/2013	GW	Monitoring Wells	March 2013 Performance	ALS	Analytical Report	Data Package	Data Validation Report
8260	3/6/2013	GW	Monitoring Wells	March 2013 Performance	Microseeps	Analytical Report	NA	NA
016KC	3/6/2013	GW	Monitoring Wells	March 2013 Performance	Microbial Insights	Analytical Report	NA	NA
1304184	4/3/2013	GW	Monitoring Wells	April 2013 Performance	ALS	Analytical Report	Data Package	Data Validation Report
8544	4/3/2013	GW	Monitoring Wells	April 2013 Performance	Microseeps	Analytical Report	NA	NA
1305123	5/1/2013	GW	Monitoring Wells	May 2013 Annual GW	ALS	Analytical Report	Data Package	Data Validation Report
1305188	5/3/2013	GW	Monitoring Wells	May 2013 Annual GW	ALS	Analytical Report	Data Package	Data Validation Report
1305190	5/3/2013	GW	Monitoring Wells	May 2013 Performance/Annual GW	ALS	Analytical Report	Data Package	Data Validation Report
011KE	5/3/2013	GW	Monitoring Wells	May 2013 Performance	Microbial Insights	Analytical Report	NA	NA
1305347	5/7/2013	GW	Monitoring Wells	May 2013 Annual GW	ALS	Analytical Report	Data Package	Data Validation Report
8870	5/7/2013	GW	Monitoring Wells	May 2013 Performance	Microseeps	Analytical Report	NA	NA
1306116	6/4/2013	GW	MW6(58) & MW30(41) resample	May 2013 Annual GW (June Resample)	ALS	Analytical Report	Data Package	NA
1307888	7/22/2013	GW	MW25(45), MW15, and MW24(24) sample	July 2013 GW Monitoring	ALS	Analytical Report	Data Package	NA

Notes:
SDG - Sample Delivery Group
NA - Not Applicable
GC - Gas Chromatograph

Laboratory Analytical Reports

are provided in

PDF format on the enclosed CD

APPENDIX G

MONITORING WELL AND VERTICAL AQUIFER SAMPLE DEVELOPMENT AND COLLECTION LOGS

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-6C** | Location: **Directly In Front (East) of TORX facility** | Page **1** of **1**

Sample ID: **MTR-MW6C-G092612** | Sampler: **Dwayne Gross & Gregg Schoenberger**

Sample Collection Time: **1652** | Sample Collection Date: **9/26/2012**

Purge Start Date: **9/26/12** | Time: **1634** | Purge Stop Date: **9/26/12** | Time: **1652**

Casing Diameter: **2 Inch** | Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **27.48** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1636	**2**	**7.36**	**0.434**	**15.0**	**1.34**	**15.36**	**16.3**	**NM**
1638	**4**	**7.25**	**0.439**	**0.0**	**0.64**	**15.30**	**2.1**	**NM**
1640	**6**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**
1642	**8**	**7.19**	**0.440**	**0.0**	**0.43**	**15.28**	**-10.3**	**NM**
1644	**10**	**7.17**	**0.440**	**0.0**	**0.38**	**15.28**	**-16.8**	**NM**
1646	**12**	**7.17**	**0.439**	**0.0**	**0.34**	**15.27**	**-26.0**	**NM**
1648	**14**	**7.17**	**0.439**	**0.0**	**0.34**	**15.28**	**-25.0**	**NM**
1650	**16**	**7.17**	**0.439**	**0.0**	**0.33**	**15.28**	**-25.8**	**NM**
1652	**18**	**7.16**	**0.439**	**0.0**	**0.31**	**15.26**	**-26.0**	**0.3**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-13**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**

Sample ID: **MTR-MW13-G092712**	Sampler: **Dwayne Gross & Gregg Schoenberger**
Sample Collection Time: **1320**	Sample Collection Date: **9/27/2012**

Purge Start Date: **9/27/12**	Time: **1252**	Purge Stop Date: **9/27/12**	Time: **1320**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1 Inch Diameter Disposable PVC Bailer, Water Level Indicator, YSI 6820 Water Quality Meter**

Pre-Purge SWL: **22.88** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2.0 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallon**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1300	**0.6**	**7.07**	**0.386**	**230.2**	**1.62**	**15.24**	**-71.0**	**NM**
1309	**1.2**	**7.19**	**0.383**	**326.6**	**2.20**	**15.12**	**-22.0**	**NM**
1320	**2.0**	**7.26**	**0.382**	**337.4**	**1.70**	**14.80**	**-13.4**	**0.2**

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well**

Completed by: WDG
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-14**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **MTR-MW14-G092712**		Sampler: **Dwayne Gross & Gregg Schoenberger**	
Sample Collection Time: **0837**		Sample Collection Date: **9/27/2012**	

Purge Start Date: **9/27/12**	Time: **0807**	Purge Stop Date: **9/27/12**	Time: **0837**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **19.05** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
0810	**3**	**7.66**	**0.404**	**1.8**	**1.57**	**13.83**	**-54.0**	**NM**
0813	**6**	**7.58**	**0.405**	**1.5**	**1.42**	**13.83**	**-50.4**	**NM**
0816	**9**	**7.18**	**0.410**	**0.0**	**0.79**	**13.85**	**-12.6**	**NM**
0819	**12**	**7.11**	**0.412**	**0.0**	**0.65**	**13.86**	**3.5**	**NM**
0822	**15**	**7.08**	**0.412**	**0.0**	**0.55**	**13.86**	**13.0**	**NM**
0825	**18**	**7.06**	**0.413**	**0.0**	**0.49**	**13.86**	**24.2**	**NM**
0828	**21**	**7.05**	**0.412**	**0.0**	**0.45**	**13.87**	**29.9**	**NM**
0831	**24**	**7.05**	**0.412**	**0.0**	**0.42**	**13.87**	**31.9**	**NM**
0834	**27**	**7.06**	**0.408**	**0.0**	**0.44**	**13.87**	**33.1**	**NM**
0837	**30**	**7.07**	**0.407**	**0.0**	**0.43**	**13.87**	**30.3**	**0.0**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **MTR-MW16-G092612**	Sampler: **Dwayne Gross & Gregg Schoenberger**	
Sample Collection Time: **1610**	Sample Collection Date: **9/26/2012**	

Purge Start Date: **9/26/12**	Time: **1552**	Purge Stop Date: **9/26/12**	Time: **1610**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **10.07** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1555	**3**	**7.24**	**0.397**	**35.1**	**0.31**	**13.20**	**3.6**	**NM**
1558	**6**	**7.24**	**0.396**	**23.6**	**0.30**	**13.19**	**-3.2**	**NM**
1601	**9**	**7.22**	**0.383**	**0.0**	**0.25**	**13.28**	**-17.9**	**NM**
1604	**12**	**7.22**	**0.383**	**0.0**	**0.24**	**13.29**	**-20.4**	**NM**
1607	**15**	**7.22**	**0.383**	**0.0**	**0.25**	**13.29**	**-22.6**	**NM**
1610	**18**	**7.23**	**0.383**	**0.0**	**0.24**	**13.31**	**-21.7**	**0.1**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**

Sample ID: **MTR-MW17-G092612**	Sampler: **Dwayne Gross & Gregg Schoenberger**
Sample Collection Time: **1530**	Sample Collection Date: **9/26/2012**

Purge Start Date: **9/26/12**	Time: **1450**	Purge Stop Date: **9/26/12**	Time: **1530**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **3.67** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1455	5	7.03	0.674	8.8	0.99	13.02	-37.4	NM
1500	10	6.99	0.668	0.8	0.45	12.80	-23.8	NM
1505	15	7.00	0.667	0.0	0.28	12.77	-14.6	NM
1510	20	7.00	0.667	0.0	0.26	12.77	-10.2	NM
1515	25	7.00	0.665	0.0	0.24	12.69	-4.5	NM
1520	30	7.00	0.664	0.0	0.24	12.67	-1.4	NM
1525	35	7.00	0.664	0.0	0.23	12.62	0.1	NM
1530	40	7.00	0.663	0.0	0.23	12.60	1.2	0.0

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW25(16.4)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **MTR-MW25(16.4)-G092712**	Sampler: **Dwayne Gross & Gregg Schoenberger**	
Sample Collection Time: **1133**	Sample Collection Date: **9/27/2012**	

Purge Start Date: **9/27/12**	Time: **1115**	Purge Stop Date: **9/27/12**	Time: **1133**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **5.42** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1118	**3**	**7.63**	**0.407**	**88.7**	**2.00**	**15.31**	**-54.7**	**NM**
1121	**6**	**7.41**	**0.407**	**12.2**	**0.83**	**15.25**	**-61.9**	**NM**
1124	**9**	**7.31**	**0.408**	**3.3**	**0.65**	**15.25**	**-64.1**	**NM**
1127	**12**	**7.25**	**0.409**	**1.9**	**0.40**	**15.24**	**-67.2**	**NM**
1130	**15**	**7.22**	**0.409**	**1.1**	**0.34**	**15.24**	**-69.6**	**NM**
1133	**18**	**7.21**	**0.410**	**0.6**	**0.30**	**15.24**	**-71.6**	**0.5**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **MTR-MW26(17.5)-G092712**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1000**	Sample Collection Date: **9/27/2012**	

Purge Start Date: **9/27/12**	Time: **0942**	Purge Stop Date: **9/27/12**	Time: **1000**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **11.17** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
0945	**3**	**7.19**	**0.428**	**0.8**	**0.30**	**14.64**	**-15.2**	**NM**
0948	**6**	**7.18**	**0.428**	**0.0**	**0.25**	**14.69**	**-20.7**	**NM**
0951	**9**	**7.19**	**0.428**	**0.0**	**0.29**	**14.72**	**-24.6**	**NM**
0954	**12**	**7.18**	**0.428**	**0.0**	**0.29**	**14.72**	**-27.6**	**NM**
0957	**15**	**7.18**	**0.428**	**0.0**	**0.28**	**14.73**	**-29.0**	**NM**
1000	**18**	**7.18**	**0.427**	**0.0**	**0.28**	**14.78**	**-32.4**	**0.0**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **MTR-MW26(28.8)-G092712**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0958**	Sample Collection Date: **9/27/2012**	

Purge Start Date: **9/27/12**	Time: **0940**	Purge Stop Date: **9/27/12**	Time: **0958**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **11.07** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **9 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
0942	**1**	**7.13**	**0.420**	**41.8**	**0.24**	**13.00**	**163.9**	**NM**
0944	**2**	**7.19**	**0.419**	**11.2**	**0.23**	**12.99**	**198.9**	**NM**
0946	**3**	**7.19**	**0.419**	**5.6**	**0.23**	**13.00**	**191.7**	**NM**
0948	**4**	**7.20**	**0.419**	**3.5**	**0.22**	**13.00**	**200.0**	**NM**
0950	**5**	**7.21**	**0.418**	**1.8**	**0.22**	**13.01**	**200.6**	**NM**
0952	**6**	**7.21**	**0.418**	**0.8**	**0.20**	**13.00**	**197.6**	**NM**
0954	**7**	**7.22**	**0.417**	**0.5**	**0.20**	**13.01**	**199.7**	**NM**
0956	**8**	**7.22**	**0.417**	**0.4**	**0.20**	**13.02**	**207.9**	**NM**
0958	**9**	**7.23**	**0.416**	**0.4**	**0.20**	**13.02**	**204.5**	**NM**

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'MTR-MW-26(28.8)-G092712R'.

Completed by: WDG
Checked by: RLB
NWB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **MTR-MW59(29)-G092712**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1220**	Sample Collection Date: **9/27/2012**	

Purge Start Date: **9/27/12**	Time: **1205**	Purge Stop Date: **9/27/12**	Time: **1220**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **15.44** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1208	**3**	**7.19**	**0.415**	**1.8**	**1.06**	**14.89**	**-73.2**	**NM**
1211	**6**	**7.02**	**0.415**	**1.2**	**0.59**	**14.93**	**-73.9**	**NM**
1214	**9**	**6.96**	**0.415**	**1.1**	**0.46**	**14.91**	**-77.6**	**NM**
1217	**12**	**6.88**	**0.417**	**0.9**	**0.37**	**14.90**	**-80.6**	**NM**
1220	**15**	**6.86**	**0.417**	**0.9**	**0.35**	**14.92**	**-81.6**	**2.5**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **MTR-MW59(46)-G092612**	Sampler: **Dwayne Gross & Gregg Schoenberger**
Sample Collection Time: **1745**	Sample Collection Date: **9/26/2012**

Purge Start Date: **9/26/12**	Time: **1716**	Purge Stop Date: **9/26/12**	Time: **1745**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **15.07** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1719	**3**	**7.47**	**0.308**	**0.0**	**1.18**	**13.88**	**-142.7**	**NM**
1722	**6**	**7.42**	**0.309**	**0.0**	**0.58**	**13.78**	**-145.4**	**NM**
1725	**9**	**7.40**	**0.309**	**0.0**	**0.38**	**13.75**	**-143.1**	**NM**
1727	**11**	**Pump Shut Off**						
1732	**11**	**Pump Restart 5 Mins Later**						
1733	**12**	**7.43**	**0.315**	**0.0**	**1.32**	**14.75**	**-133.3**	**NM**
1736	**15**	**7.38**	**0.313**	**0.0**	**0.57**	**14.49**	**-149.5**	**NM**
1739	**18**	**7.37**	**0.312**	**0.0**	**0.40**	**14.38**	**-142.0**	**NM**
1742	**21**	**7.36**	**0.313**	**0.0**	**0.38**	**14.61**	**-142.9**	**NM**
1745	**24**	**7.37**	**0.312**	**0.0**	**0.37**	**14.41**	**-144.4**	**1.9**

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'MTR-MW-MW-59(46)-G092612R'.

Completed by: WDG
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **MTR-MW60(38)-G092612**	Sampler: **Dwayne Gross & Gregg Schoenberger**	
Sample Collection Time: **1408**	Sample Collection Date: **9/26/2012**	

Purge Start Date: **9/26/12**	Time: **1335**	Purge Stop Date: **9/26/12**	Time: **1408**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **RediFlow Grunfos Pump, Control Box, Generator, Water Level Indicator, YSI 6820 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **33 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1338	**3**	**7.58**	**0.321**	**0.6**	**4.11**	**13.95**	**-98.7**	**NM**
1341	**6**	**7.49**	**0.316**	**0.0**	**2.26**	**13.86**	**-126.9**	**NM**
1344	**9**	**7.29**	**0.317**	**0.0**	**0.99**	**13.95**	**-140.5**	**NM**
1347	**12**	**7.27**	**0.318**	**0.0**	**0.80**	**13.87**	**-141.0**	**NM**
1350	**15**	**7.27**	**0.318**	**0.0**	**0.71**	**13.95**	**-143.2**	**NM**
1353	**18**	**7.30**	**0.318**	**0.0**	**0.61**	**13.88**	**-142.8**	**NM**
1356	**21**	**7.30**	**0.319**	**0.0**	**0.55**	**13.77**	**-144.8**	**NM**
1359	**24**	**7.33**	**0.320**	**0.0**	**0.51**	**13.90**	**-146.4**	**NM**
1402	**27**	**7.34**	**0.320**	**0.0**	**0.48**	**13.85**	**-144.7**	**NM**
1405	**30**	**7.35**	**0.320**	**0.0**	**0.45**	**13.92**	**-151.7**	**NM**
1408	**33**	**7.36**	**0.320**	**0.0**	**0.44**	**13.98**	**-148.2**	**1.5**

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: WDG
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-67(30)**	Location: **Inside Torx Facility**		Page **1** of **1**
Sample ID: **MTR-MW67(30)-G092612**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1400**		Sample Collection Date: **9/26/2012**	

Purge Start Date: **9/26/12**	Time: **1330**	Purge Stop Date: **9/26/12**	Time: **1400**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6820 Water Quality Meter**

Pre-Purge SWL: **25.44** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **1.5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Iron (mg/L)
1340	**0.5**	**6.80**	**0.772**	**1345**	**2.56**	**17.28**	**202.3**	**NM**
1350	**1.0**	**7.04**	**0.791**	**1344**	**3.52**	**17.27**	**172.5**	**NM**
1400	**1.5**	**7.04**	**0.784**	**1341**	**3.04**	**16.95**	**164.7**	**1.0**

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: WDG
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-1**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/24/12**	Time: **1325**	Purge Stop Date: **10/24/12**	Time: **1355**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Peristaltic, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~0.25 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **7 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1355	7	6.85	0.556	1258	NM	17.56	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-2**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **NA**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**		Sample Collection Date: **NA**	

Purge Start Date: **10/24/12**	Time: **1215**	Purge Stop Date: **10/24/12**	Time: **1245**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Peristaltic, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.51** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~0.25 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1245	8	6.83	0.656	1549	NM	17.11	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-3**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/24/12**	Time: **1250**	Purge Stop Date: **10/24/12**	Time: **1320**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Peristaltic, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.61** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~0.25 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **7.5 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1320	7.5	6.89	0.569	568	NM	18.13	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **TIW**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/24/12**	Time: **1140**	Purge Stop Date: **10/24/12**	Time: **1210**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Peristaltic, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **16.55** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **~0.25 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1210	**8**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-76(30)**	Location: **Inside TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/23/12**	Time: **1305**	Purge Stop Date: **10/23/12**	Time: **1345**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.37** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1305	**5**	**6.71**	**0.746**	**2097**	**NM**	**16.27**	**NM**	
1310	**10**	**6.72**	**0.732**	**2033**	**NM**	**16.23**	**NM**	
1315	**15**	**6.74**	**0.734**	**2078**	**NM**	**16.24**	**NM**	
1320	**20**	**6.71**	**0.736**	**1938**	**NM**	**16.23**	**NM**	
1325	**25**	**6.70**	**0.766**	**525**	**NM**	**16.20**	**NM**	
1330	**30**	**6.71**	**0.764**	**1528**	**NM**	**16.21**	**NM**	
1335	**35**	**6.71**	**0.765**	**1824**	**NM**	**16.20**	**NM**	
1340	**40**	**6.71**	**0.765**	**909**	**NM**	**16.23**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-77(41)**	Location: **Inside TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **0920**	Purge Stop Date: **10/23/12**	Time: **1000**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0925	5	7.62	0.354	407	NM	14.51	NM	
0930	10	7.67	0.325	579	NM	14.73	NM	
0935	15	7.52	0.326	483	NM	14.41	NM	
0940	20	7.54	0.326	46	NM	14.41	NM	
0945	25	7.55	0.325	100	NM	14.41	NM	
0950	30	7.56	0.325	98	NM	14.41	NM	
0955	35	7.56	0.325	408	NM	14.41	NM	
1000	40	7.56	0.325	87	NM	14.41	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-78(35)**	Location: **Inside TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1020**	Purge Stop Date: **10/23/12**	Time: **1100**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **25.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1025	5	7.33	0.508	1701	NM	15.00	NM	
1030	10	7.28	0.511	2075	NM	15.06	NM	
1035	15	7.30	0.519	1021	NM	15.06	NM	
1040	20	7.29	0.531	1869	NM	15.07	NM	
1045	25	7.28	0.540	2061	NM	15.07	NM	
1050	30	7.26	0.542	676	NM	15.06	NM	
1055	35	7.26	0.543	601	NM	15.06	NM	
1100	40	7.26	0.545	581	NM	15.06	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-79(30)**	Location: **Inside TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1120**	Purge Stop Date: **10/23/12**	Time: **1200**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.38** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1125	**5**	**7.29**	**0.404**	**440**	**NM**	**16.48**	**NM**	
1130	**10**	**7.32**	**0.387**	**1760**	**NM**	**15.32**	**NM**	
1135	**15**	**7.35**	**0.375**	**2080**	**NM**	**15.34**	**NM**	
1140	**20**	**7.35**	**0.377**	**1127**	**NM**	**15.35**	**NM**	
1145	**25**	**7.35**	**0.378**	**1056**	**NM**	**15.35**	**NM**	
1150	**30**	**7.35**	**0.377**	**1919**	**NM**	**15.35**	**NM**	
1155	**35**	**7.35**	**0.377**	**859**	**NM**	**15.36**	**NM**	
1200	**40**	**7.35**	**0.378**	**1064**	**NM**	**15.35**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-80(19)**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1435**	Purge Stop Date: **10/23/12**	Time: **1510**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **9.05** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **35 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1440	5	7.08	0.417	726	NM	17.11	NM	
1445	10	7.08	0.416	694	NM	17.13	NM	
1450	15	7.09	0.416	590	NM	17.23	NM	
1455	20	7.12	0.417	587	NM	17.68	NM	
1500	25	7.08	0.418	1401	NM	17.55	NM	
1505	30	7.04	0.416	492	NM	17.08	NM	
1510	35	7.08	0.413	289	NM	17.07	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1630**	Purge Stop Date: **10/23/12**	Time: **1710**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1635	**5**	**7.21**	**0.392**	**2268**	**NM**	**15.66**	**NM**	
1640	**10**	**7.21**	**0.322**	**1985**	**NM**	**15.46**	**NM**	
1645	**15**	**7.00**	**0.364**	**793**	**NM**	**15.40**	**NM**	
1650	**20**	**7.00**	**0.384**	**562**	**NM**	**15.39**	**NM**	
1655	**25**	**7.00**	**0.383**	**879**	**NM**	**15.38**	**NM**	
1700	**30**	**6.96**	**0.389**	**465**	**NM**	**15.39**	**NM**	
1705	**35**	**6.97**	**0.390**	**446**	**NM**	**15.39**	**NM**	
1710	**40**	**6.97**	**0.390**	**448**	**NM**	**15.40**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW81(45)-G120512**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1005**	Sample Collection Date: **12/5/2012**	

Purge Start Date: **12/5/12**	Time: **0840**	Purge Stop Date: **12/5/12**	Time: **1005**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.92** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **85 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0845	5	7.67	0.570	1445	1.45	12.42	127.7	
0850	10	7.61	0.571	1445	0.93	12.52	106.1	
0855	15	7.60	0.574	617.1	0.88	12.29	88.5	
0900	20	7.59	0.579	605.1	0.86	11.49	77.3	
0905	25	7.59	0.582	599.6	0.86	10.87	69.1	
0910	30	7.59	0.585	593.2	0.92	9.72	59.6	
0915	35	7.61	0.586	593.0	0.94	9.45	58.1	
0920	40	7.62	0.583	29.2	0.95	9.47	52.5	
0925	45	7.62	0.583	43.4	0.98	9.93	47.9	
0930	50	7.63	0.585	28.1	0.98	10.43	44.8	
0935	55	7.62	0.588	17.1	0.97	10.95	42.4	
0940	60	7.62	0.589	7.5	0.99	10.96	40.0	
0945	65	7.63	0.591	4.5	0.99	10.95	39.2	
0950	70	7.56	0.571	88.0	0.74	13.46	31.0	
0955	75	7.57	0.569	49.5	0.62	13.20	23.0	
1000	80	7.60	0.568	5.3	0.61	13.13	4.5	
1005	85	7.60	0.567	3.9	0.59	13.14	3.8	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-82(58)**	Location: **East of TORX facility, across Old US 31 N**		Page **1** of **1**
Sample ID: **ATR-MW82(58)-G103112**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1210**		Sample Collection Date: **10/31/2012**	

Purge Start Date: **10/31/12**	Time: **1120**	Purge Stop Date: **10/31/12**	Time: **1210**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.57** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1125	5	7.69	0.553	1198	NM	12.93	NM	
1130	10	7.59	0.557	460	NM	13.16	NM	
1135	15	7.54	0.556	1176	NM	13.13	NM	
1140	20	7.50	0.555	128	NM	13.13	NM	
1145	25	7.48	0.553	708	NM	13.12	NM	
1150	30	7.46	0.554	400	NM	13.13	NM	
1155	35	7.46	0.555	872	NM	13.13	NM	
1200	40	7.45	0.546	1201	NM	13.17	NM	
1205	45	7.44	0.548	1200	NM	13.08	NM	
1210	50	7.43	0.552	1003	NM	13.21	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-83(64)**	Location: **East of TORX facility, across Old US 31 N**		Page **1** of **1**
Sample ID: **ATR-MW83(64)-G110312**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1405**		Sample Collection Date: **11/3/2012**	

Purge Start Date: **11/3/12**	Time: **1310**	Purge Stop Date: **11/3/12**	Time: **1400**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.28** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1315	5	7.37	0.540	1257	NM	13.26	NM	
1320	10	7.34	0.539	1872	NM	13.29	NM	
1325	15	7.36	0.537	1872	NM	13.30	NM	
1330	20	7.33	0.539	848	NM	13.33	NM	
1335	25	7.32	0.537	1872	NM	13.31	NM	
1340	30	7.32	0.540	308	NM	13.35	NM	
1345	35	7.33	0.541	868	NM	13.35	NM	
1350	40	7.33	0.542	901	NM	13.36	NM	
1355	45	7.33	0.538	1870	NM	13.33	NM	
1400	50	7.32	0.539	187	NM	13.32	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(44)**	Location: **Top of hill East of NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW84(44)-G110412**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1445**	Sample Collection Date: **11/4/2012**	

Purge Start Date: **11/4/12**	Time: **1400**	Purge Stop Date: **11/4/12**	Time: **1445**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **38.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1405	**5**	**7.36**	**0.854**	**1192**	**NM**	**12.35**	**NM**	
1410	**10**	**7.38**	**0.855**	**1196**	**NM**	**12.36**	**NM**	Well dry
1435	**15**	**7.40**	**0.868**	**1050**	**NM**	**12.37**	**NM**	Restart purge
1440	**20**	**7.32**	**0.869**	**312.6**	**NM**	**12.41**	**NM**	
1445	**25**	**7.29**	**0.872**	**128.0**	**NM**	**12.39**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(65)**	Location: **Top of hill East of NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW84(65)-G110412**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1350**	Sample Collection Date: **11/4/2012**	

Purge Start Date: **11/4/12**	Time: **1300**	Purge Stop Date: **11/4/12**	Time: **1350**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **39.06** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1305	**5**	**6.77**	**0.750**	**1194**	**NM**	**12.52**	**NM**	
1310	**10**	**6.87**	**0.713**	**1195**	**NM**	**12.63**	**NM**	
1315	**15**	**6.94**	**0.710**	**1104**	**NM**	**12.62**	**NM**	
1320	**20**	**7.07**	**0.703**	**261**	**NM**	**12.65**	**NM**	
1325	**25**	**7.10**	**0.702**	**1195**	**NM**	**12.66**	**NM**	
1330	**30**	**7.14**	**0.688**	**1195**	**NM**	**12.63**	**NM**	
1335	**35**	**7.15**	**0.696**	**131**	**NM**	**12.67**	**NM**	
1340	**40**	**7.18**	**0.696**	**489**	**NM**	**12.64**	**NM**	
1345	**45**	**7.19**	**0.696**	**524**	**NM**	**12.64**	**NM**	
1350	**50**	**7.20**	**0.695**	**517**	**NM**	**12.65**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(39)**	Location: **4377 NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW85(39)-G120112**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1545**	Sample Collection Date: **12/1/2012**	

Purge Start Date: **12/1/12**	Time: **1445**	Purge Stop Date: **12/1/12**	Time: **1545**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.42** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **60 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1450	5	8.94	0.937	1951	1.98	11.50	-239	
1455	10	8.63	0.813	1954	0.94	11.79	-338	
1500	15	8.30	0.774	1954	0.58	11.67	-384	
1505	20	8.17	0.754	1565	0.45	11.77	-400	
1510	25	8.08	0.765	1958	0.60	11.96	-387	
1515	30	7.93	0.722	902	0.24	11.77	-460	
1520	35	7.89	0.717	710	0.22	11.79	-468	
1525	40	7.83	0.709	465	0.19	11.78	-470	
1530	45	7.80	0.705	392	0.19	11.78	-469	
1535	50	7.77	0.701	312	0.19	11.78	-469	
1540	55	7.77	0.698	277	0.19	11.75	-468	
1545	60	7.74	0.697	240	0.19	11.75	-471	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(70)**	Location: **4377 NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW85(70)-G120112**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1435**	Sample Collection Date: **12/1/2012**	

Purge Start Date: **12/1/12**	Time: **1255**	Purge Stop Date: **12/1/12**	Time: **1435**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **13.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **100 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1305	**10**	**8.14**	**0.750**	**1952**	**0.20**	**11.55**	**-566**	
1315	**20**	**7.77**	**0.701**	**1940**	**0.15**	**11.53**	**-553**	
1325	**30**	**7.70**	**0.686**	**919**	**0.13**	**11.51**	**-534**	
1335	**40**	**7.67**	**0.679**	**930**	**0.11**	**11.52**	**-536**	
1345	**50**	**7.64**	**0.673**	**915**	**0.11**	**11.52**	**-539**	
1355	**60**	**7.62**	**0.665**	**533**	**0.11**	**11.52**	**-534**	
1405	**70**	**7.61**	**0.659**	**1951**	**0.10**	**11.50**	**-536**	
1415	**80**	**7.58**	**0.656**	**237**	**0.09**	**11.50**	**-524**	
1425	**90**	**7.57**	**0.655**	**127**	**0.09**	**11.50**	**-519**	
1435	**100**	**7.56**	**0.654**	**126**	**0.09**	**11.50**	**-512**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(130)**	Location: **4377 NOUSHWY31**		Page **1** of **1**
Sample ID: **ATR-MW85(130)-G120112**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1205**		Sample Collection Date: **12/1/2012**	

Purge Start Date: **12/1/12**	Time: **0905**	Purge Stop Date: **12/1/12**	Time: **1205**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.46** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **180 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0915	10	8.12	0.697	1777	0.25	11.22	-272	
0925	20	7.95	0.718	1946	0.19	11.10	-288	
0935	30	7.86	0.721	1660	0.14	11.42	-342	
0945	40	7.80	0.736	1701	0.14	11.42	-344	
0955	50	7.78	0.754	685	0.13	11.39	-411	
1005	60	7.75	0.765	495	0.12	11.59	-464	
1015	70	7.72	0.776	733	0.11	11.43	-468	
1025	80	7.66	0.786	781	0.11	11.66	-454	
1035	90	7.65	0.797	959	0.10	11.52	-452	
1045	100	7.63	0.808	300	0.10	11.65	-437	
1055	110	7.59	0.826	346	0.10	11.68	-449	
1105	120	7.56	0.833	296	0.10	11.68	-402	
1115	130	7.55	0.846	238	0.10	11.69	-432	
1125	140	7.52	0.848	172	0.10	11.70	-416	
1135	150	7.52	0.850	137	0.10	11.70	-410	
1145	160	7.48	0.857	174	0.10	11.72	-380	
1155	170	7.45	0.859	174	0.10	11.74	-383	
1205	180	7.44	0.861	166	0.10	11.75	-381	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-89(28)**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1545**	Purge Stop Date: **10/23/12**	Time: **1625**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.90** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1550	5	7.13	0.414	510	NM	17.82	NM	
1555	10	7.13	0.414	808	NM	17.82	NM	
1600	15	7.13	0.414	765	NM	17.82	NM	
1605	20	7.17	0.395	404	NM	17.80	NM	
1610	25	7.18	0.396	1121	NM	15.25	NM	
1615	30	7.17	0.392	329	NM	15.27	NM	
1620	35	7.18	0.392	323	NM	15.20	NM	
1625	40	7.18	0.392	297	NM	15.78	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-3E**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/22/12**	Time: **1625**	Purge Stop Date: **10/22/12**	Time: **1715**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **17.60** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1630	5	7.69	0.255	2050	NM	13.77	NM	
1635	10	7.66	0.256	1651	NM	13.76	NM	
1640	15	7.68	0.254	2043	NM	13.78	NM	
1645	20	7.69	0.255	1125	NM	13.76	NM	
1650	25	7.68	0.256	2049	NM	13.76	NM	
1655	30	7.67	0.255	1068	NM	13.77	NM	
1700	35	7.68	0.255	1248	NM	13.78	NM	
1705	40	7.69	0.254	1146	NM	13.80	NM	
1710	45	7.69	0.255	1065	NM	13.80	NM	
1715	50	7.69	0.255	1152	NM	13.80	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-3N**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **W. Dwayne Gross**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/23/12**	Time: **0845**	Purge Stop Date: **10/23/12**	Time: **0935**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.32** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0850	**5**	**7.18**	**0.401**	**453.2**	**NM**	**13.48**	**NM**	
0855	**10**	**7.43**	**0.375**	**1183.9**	**NM**	**13.43**	**NM**	
0900	**15**	**7.51**	**0.354**	**1183.8**	**NM**	**13.43**	**NM**	
0905	**20**	**7.56**	**0.349**	**1036.1**	**NM**	**13.38**	**NM**	
0910	**25**	**7.57**	**0.346**	**1152.1**	**NM**	**13.38**	**NM**	
0915	**30**	**7.60**	**0.357**	**1183.8**	**NM**	**13.47**	**NM**	
0920	**35**	**7.57**	**0.373**	**1184.2**	**NM**	**13.43**	**NM**	
0925	**40**	**7.61**	**0.349**	**860.8**	**NM**	**13.39**	**NM**	
0930	**45**	**7.64**	**0.353**	**1176.4**	**NM**	**13.41**	**NM**	
0935	**50**	**7.66**	**0.350**	**1181.9**	**NM**	**13.41**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-6N**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **W. Dwayne Gross**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **0940**	Purge Stop Date: **10/23/12**	Time: **1030**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0945	**5**	**7.56**	**0.355**	**1186.1**	**NM**	**13.64**	**NM**	
0950	**10**	**7.55**	**0.357**	**1053.7**	**NM**	**13.62**	**NM**	
0955	**15**	**7.55**	**0.358**	**901.3**	**NM**	**13.59**	**NM**	
1000	**20**	**7.56**	**0.352**	**1186.0**	**NM**	**13.63**	**NM**	
1005	**25**	**7.57**	**0.354**	**1189.7**	**NM**	**13.58**	**NM**	
1010	**30**	**7.58**	**0.354**	**1186.0**	**NM**	**13.63**	**NM**	
1015	**35**	**7.59**	**0.354**	**1186.0**	**NM**	**13.63**	**NM**	
1020	**40**	**7.60**	**0.354**	**1171.0**	**NM**	**13.59**	**NM**	
1025	**45**	**7.59**	**0.354**	**1185.6**	**NM**	**13.59**	**NM**	
1030	**50**	**7.60**	**0.354**	**1016.9**	**NM**	**13.62**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-33E**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/22/12**	Time: **1141**	Purge Stop Date: **10/22/12**	Time: **1231**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **17.40** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1146	5	NM	NM	NM	NM	NM	NM	
1151	10	NM	NM	NM	NM	NM	NM	
1156	15	7.62	0.273	2015	NM	13.70	NM	
1201	20	7.62	0.273	2000	NM	13.69	NM	
1206	25	7.61	0.273	1800	NM	13.67	NM	
1211	30	7.61	0.275	1900	NM	13.69	NM	
1216	35	7.62	0.276	2000	NM	13.70	NM	
1221	40	7.61	0.275	1800	NM	13.70	NM	
1226	45	7.60	0.275	1500	NM	13.67	NM	
1231	50	7.62	0.275	1650	NM	13.70	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-6W**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **NA**		Sampler: **W. Dwayne Gross**	
Sample Collection Time: **NA**		Sample Collection Date: **NA**	

Purge Start Date: **10/22/12**	Time: **1520**	Purge Stop Date: **10/22/12**	Time: **1555**

Casing Diameter: **2 inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **35 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1525	5	8.64	0.534	389.6	NM	13.28	NM	
1530	10	7.97	0.533	570.0	NM	13.29	NM	
1535	15	7.91	0.530	1223.5	NM	13.25	NM	
1540	20	7.88	0.529	1223.6	NM	13.29	NM	
1545	25	7.89	0.525	1185.6	NM	13.28	NM	
1550	30	7.89	0.525	702.4	NM	13.27	NM	
1555	35	7.90	0.530	1224.8	NM	13.27	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-10E**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/22/12**	Time: **1510**	Purge Stop Date: **10/22/12**	Time: **1555**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.59** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **45 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1515	5	7.66	0.259	2229	NM	13.82	NM	
1520	10	7.72	0.258	2048	NM	13.83	NM	
1525	15	7.74	0.257	1982	NM	13.85	NM	
1530	20	7.73	0.261	1980	NM	13.86	NM	
1535	25	7.72	0.262	877	NM	13.87	NM	
1540	30	7.71	0.263	985	NM	13.90	NM	
1545	35	7.71	0.264	1460	NM	13.88	NM	
1550	40	7.71	0.263	1500	NM	13.90	NM	
1555	45	7.70	0.263	1345	NM	13.90	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RWB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-15E**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/22/12**	Time: **1332**	Purge Stop Date: **10/22/12**	Time: **1424**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **17.40** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1337	**5**	**7.56**	**0.269**	**1550**	**NM**	**13.76**	**NM**	
1342	**10**	**7.57**	**0.270**	**2052**	**NM**	**13.78**	**NM**	
1347	**15**	**7.58**	**0.272**	**1693**	**NM**	**13.73**	**NM**	
1352	**20**	**7.59**	**0.273**	**1700**	**NM**	**13.73**	**NM**	
1357	**25**	**7.60**	**0.273**	**755.0**	**NM**	**13.73**	**NM**	
1402	**30**	**7.60**	**0.274**	**1202**	**NM**	**13.76**	**NM**	
1407	**35**	**7.60**	**0.274**	**1160**	**NM**	**13.77**	**NM**	
1412	**40**	**7.60**	**0.274**	**499.4**	**NM**	**13.75**	**NM**	
1417	**45**	**7.60**	**0.275**	**537.5**	**NM**	**13.74**	**NM**	
1422	**50**	**7.59**	**0.274**	**624.0**	**NM**	**13.75**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-15N**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **NA**		Sampler: **W. Dwayne Gross**	
Sample Collection Time: **NA**		Sample Collection Date: **NA**	

Purge Start Date: **10/22/12**	Time: **1625**	Purge Stop Date: **10/22/12**	Time: **1715**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.62** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1630	**5**	**8.12**	**0.534**	**1227.4**	**NM**	**14.30**	**NM**	
1635	**10**	**8.18**	**0.507**	**549.2**	**NM**	**14.39**	**NM**	
1640	**15**	**8.18**	**0.509**	**1234.1**	**NM**	**14.34**	**NM**	
1645	**20**	**8.17**	**0.511**	**1123.1**	**NM**	**14.32**	**NM**	
1650	**25**	**8.19**	**0.502**	**1227.8**	**NM**	**14.33**	**NM**	
1655	**30**	**8.20**	**0.491**	**1234.3**	**NM**	**14.37**	**NM**	
1700	**35**	**8.20**	**0.493**	**1234.2**	**NM**	**14.36**	**NM**	
1705	**40**	**8.20**	**0.492**	**687.4**	**NM**	**14.34**	**NM**	
1710	**45**	**8.15**	**0.524**	**1233.8**	**NM**	**14.25**	**NM**	
1715	**50**	**8.16**	**0.499**	**1233.7**	**NM**	**14.31**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
rwb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-25E**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **10/22/12**	Time: **1238**	Purge Stop Date: **10/22/12**	Time: **1328**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **17.26** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1243	5	7.62	0.294	1963	NM	13.71	NM	
1248	10	7.63	0.294	2032	NM	13.71	NM	
1253	15	7.63	0.287	2040	NM	13.11	NM	
1258	20	7.62	0.284	1248	NM	13.70	NM	
1303	25	7.62	0.280	1088	NM	13.58	NM	
1308	30	7.63	0.277	1598	NM	13.59	NM	
1313	35	7.62	0.276	452	NM	13.69	NM	
1318	40	7.62	0.275	1047	NM	13.71	NM	
1323	45	7.62	0.274	838	NM	13.71	NM	
1328	50	7.61	0.273	421	NM	13.71	NM	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-25N**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **NA**		Sampler: **W. Dwayne Gross**	
Sample Collection Time: **NA**		Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1035**	Purge Stop Date: **10/23/12**	Time: **1125**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.99** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1040	**5**	**7.71**	**0.268**	**1197.1**	**NM**	**14.86**	**NM**	
1045	**10**	**7.74**	**0.271**	**1183.8**	**NM**	**14.81**	**NM**	
1050	**15**	**7.77**	**0.273**	**1096.8**	**NM**	**14.75**	**NM**	
1055	**20**	**7.79**	**0.276**	**1152.9**	**NM**	**14.71**	**NM**	
1100	**25**	**7.80**	**0.281**	**1079.3**	**NM**	**14.73**	**NM**	
1105	**30**	**7.81**	**0.283**	**1198.1**	**NM**	**14.67**	**NM**	
1110	**35**	**7.82**	**0.288**	**1161.6**	**NM**	**14.78**	**NM**	
1115	**40**	**7.82**	**0.287**	**1195.6**	**NM**	**14.67**	**NM**	
1120	**45**	**7.83**	**0.291**	**1186.5**	**NM**	**14.67**	**NM**	
1125	**50**	**7.83**	**0.291**	**1179.6**	**NM**	**14.66**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **East of pond at 4377**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **12/5/12**	Time: **1050**	Purge Stop Date: **12/5/12**	Time: **1130**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.71** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1055	5	6.96	1.603	662.4	0.42	13.52	98.9	
1100	10	6.77	1.568	779.1	0.39	13.58	77.1	
1105	15	6.71	1.543	1416.1	0.38	13.67	65.5	
1110	20	6.67	1.551	1286.1	0.37	13.58	57.7	
1115	25	6.64	1.601	161.7	0.36	13.59	50.6	
1120	30	6.62	1.613	76.1	0.34	13.64	44.2	
1125	35	6.61	1.618	27.1	0.33	13.67	39.6	
1130	40	6.61	1.620	15.0	0.33	13.66	38.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **East of Pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI1(34.5)-G120412**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1620**		Sample Collection Date: **12/4/2012**	

Purge Start Date: **12/4/12**	Time: **1520**	Purge Stop Date: **12/4/12**	Time: **1620**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **60 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1525	5	7.38	0.711	1457	1.76	13.07	126.9	
1530	10	6.87	0.945	1457	0.80	13.06	41.1	
1535	15	6.70	1.061	1457	0.61	13.07	-13.7	
1540	20	6.64	1.184	1226	0.45	13.08	-27.2	
1545	25	6.58	1.257	517.6	0.43	13.07	-30.4	
1550	30	6.56	1.359	182.4	0.41	13.03	-35.1	
1555	35	6.46	1.516	50.1	0.36	13.02	-30.9	
1600	40	6.45	1.517	48.1	0.37	13.03	-30.9	
1605	45	6.42	1.580	23.9	0.36	13.03	-29.1	
1610	50	6.39	1.620	25.1	0.39	13.02	-28.3	
1615	55	6.38	1.622	11.0	0.39	13.02	-28.0	
1620	60	6.39	1.623	5.1	0.39	13.02	-29.0	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **East of pond at 4377**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **12/5/12**	Time: **1300**	Purge Stop Date: **12/5/12**	Time: **1350**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.57** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1305	**5**	**7.29**	**0.753**	**738.0**	**0.41**	**13.01**	**41.7**	
1310	**10**	**7.32**	**0.753**	**1118**	**0.36**	**13.08**	**40.2**	
1315	**15**	**7.34**	**0.745**	**1459**	**0.38**	**13.07**	**38.1**	
1320	**20**	**7.30**	**0.746**	**892.6**	**0.35**	**13.10**	**41.5**	
1325	**25**	**7.27**	**0.748**	**357.3**	**0.37**	**13.08**	**43.6**	
1330	**30**	**7.26**	**0.749**	**245.1**	**0.33**	**13.12**	**44.3**	
1335	**35**	**7.25**	**0.752**	**138.5**	**0.32**	**13.09**	**44.8**	
1340	**40**	**7.26**	**0.755**	**65.5**	**0.32**	**13.08**	**44.9**	
1345	**45**	**7.27**	**0.756**	**21.2**	**0.32**	**13.10**	**51.3**	
1350	**50**	**7.27**	**0.758**	**8.6**	**0.31**	**13.10**	**52.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **East of Pond at 4377**	Page **1** of **1**

Sample ID: **NA**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **NA**	Sample Collection Date: **NA**

Purge Start Date: **12/5/12**	Time: **1205**	Purge Stop Date: **12/5/12**	Time: **1255**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.51** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **50 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1210	**5**	**7.20**	**1.186**	**1052**	**0.51**	**12.77**	**78.2**	
1215	**10**	**7.10**	**1.185**	**1353**	**0.46**	**12.88**	**59.0**	
1220	**15**	**7.08**	**1.139**	**1455**	**0.47**	**12.90**	**51.6**	
1225	**20**	**6.97**	**1.214**	**1903**	**0.61**	**12.92**	**44.6**	
1230	**25**	**6.94**	**1.232**	**160.8**	**0.39**	**12.89**	**44.3**	
1235	**30**	**6.91**	**1.231**	**122.6**	**0.38**	**12.86**	**39.3**	
1240	**35**	**6.87**	**1.261**	**43.3**	**0.37**	**12.60**	**37.5**	
1245	**40**	**6.84**	**1.264**	**24.5**	**0.36**	**12.59**	**35.8**	
1250	**45**	**6.82**	**1.266**	**11.6**	**0.35**	**12.61**	**35.2**	
1255	**50**	**6.81**	**1.268**	**5.5**	**0.35**	**12.61**	**34.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: PM-1	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **NA**	Sampler: **W. Dwayne Gross**	
Sample Collection Time: **NA**	Sample Collection Date: **NA**	

Purge Start Date: **10/23/12**	Time: **1135**	Purge Stop Date: **10/23/12**	Time: **1255**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.80** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **34 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1140	**5**	**7.40**	**0.789**	**1187.4**	**NM**	**15.76**	**NM**	Well Dry
1148	**8**	**7.34**	**0.794**	**1234.6**	**NM**	**15.65**	**NM**	Dry @ 8 gal
1156	**11**	**7.21**	**0.735**	**937.9**	**NM**	**15.52**	**NM**	Dry @ 11 gal
1211	**16**	**7.04**	**0.743**	**1179.0**	**NM**	**15.78**	**NM**	1201 Restart
1221	**21**	**6.97**	**0.723**	**1204.3**	**NM**	**15.72**	**NM**	0.5 gpm
1231	**26**	**7.00**	**0.654**	**1204.1**	**NM**	**15.70**	**NM**	
1241	**31**	**6.98**	**0.686**	**1180.6**	**NM**	**15.53**	**NM**	Dry @ 31 gal
1255	**34**	**6.93**	**0.737**	**1206.3**	**NM**	**15.84**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM2-G110512**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0932**		Sample Collection Date: **11/5/2012**	

Purge Start Date: **11/5/12**	Time: **0830**	Purge Stop Date: **11/5/12**	Time: **0932**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.32** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute** *(0.5 gpm for sampling 22-36 gallons)*

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **36 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0835	5	6.83	0.605	1888	NM	15.52	NM	
0840	10	6.85	0.613	1777	NM	15.41	NM	
0845	15	6.83	0.604	1336	NM	15.32	NM	
0850	20	6.82	0.616	1888	NM	15.49	NM	
0854*	22	6.80	0.618	58.0	1.87	15.64	-29.5	
0904	24	6.81	0.613	288.0	0.94	15.49	-44.3	
0908**	26	6.79	0.616	91.6	1.22	15.50	-42.4	
0924	28	6.77	0.615	32.7	0.85	15.68	-46.9	
0928	32	6.77	0.616	9.6	0.62	15.68	-49.2	
0932	36	6.78	0.617	5.4	0.61	15.69	-49.8	

Comments: **NM = Not Measured, SWL = Static Water Level**
*** - well dry at 0856, well allowed to recover, restarted pump @ 0900.**
**** - well dry at 0921, well allowed to recover, restarted pump @ 0920.**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-PM3-G110512**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1220**	Sample Collection Date: **11/5/2012**	

Purge Start Date: **11/5/12**	Time: **1140**	Purge Stop Date: **11/5/12**	Time: **1220**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.70** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1145	5	6.52	0.622	1888	0.07	13.99	-31.1	
1150	10	6.52	0.626	639	0.07	13.97	-31.2	
1155	15	6.53	0.636	1888	0.07	13.99	-33.4	
1200	20	6.52	0.636	365	0.10	13.99	-27.0	
1205	25	6.51	0.637	31.0	0.80	13.98	-29.2	
1210	30	6.51	0.641	23.2	0.70	14.01	-30.6	
1215	35	6.51	0.644	9.8	0.60	14.00	-31.9	
1220	40	6.51	0.645	8.6	0.60	13.98	-31.8	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-1**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **ATR-INJ1-G112812**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1510**	Sample Collection Date: **11/28/2012**

Purge Start Date: **11/28/12**	Time: **1450**	Purge Stop Date: **11/28/12**	Time: **1510**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable bailer**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.91** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1500	**0.5**	**8.07**	**0.606**	**1211**	**2.49**	**14.26**	**72.6**	
1505	**1.0**	**8.04**	**0.602**	**1321**	**2.68**	**14.00**	**57.6**	
1510	**1.5**	**8.02**	**0.599**	**1325**	**3.14**	**13.76**	**46.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359112583

Well No.: **MW-67(30)**	Location: **Inside Torx Facility**		Page **1** of **1**
Sample ID: **ATR-MW67(30)-G110712**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0810**		Sample Collection Date: **11/7/2012**	

Purge Start Date: **11/7/12**	Time: **0730**	Purge Stop Date: **11/7/12**	Time: **0810**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6820 Water Quality Meter**

Pre-Purge SWL: **23.63** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **2 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0750	1	6.99	NM	400	2.53	15.23	-233.0	
0810	2	7.03	NM	898	2.48	15.45	-241.0	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-76(30)**	Location: **Inside TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW76(30)-G101812**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1051**		Sample Collection Date: **10/18/2012**	

Purge Start Date: **10/18/12**	Time: **1033**	Purge Stop Date: **10/18/12**	Time: **1051**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer**

Pre-Purge SWL: **25.38** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallons/minute**

Total Quantity of Water Bailed: **4 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1051	**4**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-77(41)**	Location: Inside **TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW77(41)-G102012**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1127**		Sample Collection Date: **10/20/2012**	

Purge Start Date: **10/20/12**	Time: **1115**	Purge Stop Date: **10/20/12**	Time: **1127**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer**

Pre-Purge SWL: **25.55** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **8 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1127	**8**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-78(35)**	Location: **Inside TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW78(35)-G101812**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1028**		Sample Collection Date: **10/18/2012**	

Purge Start Date: **10/18/12**	Time: **1015**	Purge Stop Date: **10/18/12**	Time: **1028**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer**

Pre-Purge SWL: **25.48** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallons/minute**

Total Quantity of Water Bailed: **5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1028	**5**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-79(30)**	Location: **Inside TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW79(30)-G102012**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1150**		Sample Collection Date: **10/20/2012**	

Purge Start Date: **10/20/12**	Time: **1140**	Purge Stop Date: **10/20/12**	Time: **1150**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer**

Pre-Purge SWL: **23.40** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **4 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1150	**4**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW81(27)-G110512**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1040**	Sample Collection Date: **11/5/2012**	

Purge Start Date: **11/5/12**	Time: **1015**	Purge Stop Date: **11/5/12**	Time: **1040**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.21** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1020	**5**	**6.50**	**0.488**	**98.5**	**0.14**	**15.32**	**-50.8**	
1025	**10**	**6.81**	**0.488**	**27.5**	**0.10**	**15.33**	**-57.1**	
1030	**15**	**6.83**	**0.488**	**20.6**	**0.10**	**15.32**	**-59.1**	
1035	**20**	**6.82**	**0.488**	**10.3**	**0.09**	**15.26**	**-62.4**	
1040	**25**	**6.82**	**0.486**	**5.3**	**0.09**	**15.32**	**-65.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-89(28)**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW89(28)-G102112**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1548**	Sample Collection Date: **10/21/2012**	

Purge Start Date: **10/21/12**	Time: **1530**	Purge Stop Date: **10/21/12**	Time: **1548**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer**

Pre-Purge SWL: **16.86** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **7 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1548	**7**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **ATR-PM1-G110512**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1120**	Sample Collection Date: **11/5/2012**

Purge Start Date: **11/5/12**	Time: **1105**	Purge Stop Date: **11/5/12**	Time: **1120**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.71** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1110	**5**	**7.02**	**0.715**	**81.7**	**0.26**	**15.91**	**-74.3**	
1115	**10**	**6.99**	**0.691**	**11.2**	**0.17**	**15.81**	**-75.0**	
1120	**15**	**6.95**	**0.688**	**5.2**	**0.16**	**15.93**	**-79.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **11/27/12**	Time: **1235**	Purge Stop Date: **11/27/12**	Time: **1305**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Control Box, Generator, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **10.77** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **~ 1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1240	5	6.62	0.639	1.4	NM	12.70	23.6	
1245	10	6.28	0.773	0.0	NM	12.75	-10.3	
1250	15	6.27	0.772	0.0	NM	12.71	-21.0	
1255	20	6.28	0.763	0.0	NM	12.71	-31.1	
1300	25	6.28	0.762	0.0	NM	12.75	-36.4	
1305	30	6.28	0.765	0.0	NM	12.73	-38.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **11/27/12**	Time: **1420**	Purge Stop Date: **11/27/12**	Time: **1440**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Control Box, Generator, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **11.47** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~ 1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1425	**5**	**6.96**	**0.504**	**14.5**	**0.34**	**13.06**	**-60.8**	
1430	**10**	**7.02**	**0.505**	**2.5**	**0.30**	**13.01**	**-69.1**	
1435	**15**	**7.04**	**0.504**	**0.4**	**0.29**	**13.02**	**-73.3**	
1440	**20**	**7.04**	**0.505**	**0.2**	**0.28**	**13.03**	**-75.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **11/27/12**	Time: **1350**	Purge Stop Date: **11/27/12**	Time: **1410**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Control Box, Generator, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **11.44** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~ 1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1355	5	6.70	0.830	86.4	0.53	12.34	22.4	
1400	10	6.71	0.833	11.6	0.35	12.46	-13.6	
1405	15	6.72	0.832	5.7	0.31	12.48	-29.3	
1410	20	6.73	0.833	4.2	0.29	12.50	-31.2	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/18/12**	Time: **1048**	Purge Stop Date: **12/18/12**	Time: **1108**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.54*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1052	4	7.38	0.600	NM	0.46	12.73	52.9	
1056	8	7.12	0.712	NM	0.37	12.67	48.9	
1100	12	7.00	0.794	NM	0.37	12.69	48.4	
1104	16	6.84	0.866	NM	0.34	12.71	47.0	
1108	20	6.81	0.877	NM	0.32	12.71	45.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/18/12**	Time: **1020**	Purge Stop Date: **12/18/12**	Time: **1036**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.30*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1024	**4**	**7.16**	**0.735**	**NM**	**1.44**	**12.07**	**80.5**	
1028	**8**	**7.13**	**0.746**	**NM**	**0.32**	**11.92**	**76.9**	
1032	**12**	**7.13**	**0.749**	**NM**	**0.24**	**11.94**	**75.5**	
1036	**16**	**7.12**	**0.750**	**NM**	**0.24**	**11.94**	**74.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=0.0 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Dwayne Gross**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/18/12**	Time: **1117**	Purge Stop Date: **12/18/12**	Time: **1133**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.56*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1121	**4**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	
1125	**8**	**7.08**	**0.658**	**NM**	**0.33**	**12.97**	**1.0**	
1129	**12**	**7.09**	**0.659**	**NM**	**0.33**	**12.99**	**-0.5**	
1133	**16**	**7.10**	**0.659**	**NM**	**0.32**	**12.98**	**-1.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/18/12**	Time: **1045**	Purge Stop Date: **12/18/12**	Time: **1105**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.56*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1049	**4**	**6.71**	**1.149**	**NM**	**0.56**	**13.31**	**-76.4**	
1053	**8**	**6.71**	**1.153**	**NM**	**0.32**	**13.40**	**-84.9**	
1057	**12**	**6.70**	**1.165**	**NM**	**0.24**	**13.40**	**-91.5**	
1101	**16**	**6.69**	**1.145**	**NM**	**0.20**	**13.40**	**-95.3**	
1105	**20**	**6.70**	**1.150**	**NM**	**0.19**	**13.40**	**-96.2**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=6.5 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/18/12**	Time: **0920**	Purge Stop Date: **12/18/12**	Time: **0940**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.53*** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0925	**5**	**7.52**	**0.368**	**0.8**	**0.40**	**13.47**	**-159.0**	
0930	**10**	**7.53**	**0.369**	**1.1**	**0.30**	**13.39**	**-169.8**	
0935	**15**	**7.54**	**0.368**	**1.2**	**0.25**	**13.35**	**-177.1**	
0940	**20**	**7.53**	**0.368**	**1.1**	**0.21**	**13.34**	**-181.5**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.0 mg/L**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Dwayne Gross**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/18/12**	Time: **0944**	Purge Stop Date: **12/18/12**	Time: **1004**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.91*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0949	**5**	**7.49**	**0.430**	**NM**	**0.43**	**13.12**	**-11.3**	
0954	**10**	**7.50**	**0.433**	**NM**	**0.40**	**13.16**	**-28.7**	
0959	**15**	**7.51**	**0.437**	**NM**	**0.39**	**13.10**	**-37.9**	
1004	**20**	**7.51**	**0.437**	**NM**	**0.38**	**13.03**	**-46.6**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Dwayne Gross**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/18/12**	Time: **0919**	Purge Stop Date: **12/18/12**	Time: **0938**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: Keck **Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.97*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0923	**5**	**7.45**	**0.460**	**42.1**	**0.56**	**12.47**	**42.8**	
0928	**10**	**7.45**	**0.476**	**731.4**	**0.50**	**12.24**	**13.8**	
0933	**15**	**7.46**	**0.479**	**231.6**	**0.46**	**12.24**	**-5.5**	
0938	**20**	**7.47**	**0.479**	**152.3**	**0.45**	**12.25**	**-9.6**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**
*** - Depth to water measured on 12/17/2012**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(39)**	Location: **4377 NOUSHWY31**		Page **1** of **1**
Sample ID: **ATR-MW85(39)-G121812**		Sampler: **Dwayne Gross**	
Sample Collection Time: **0859**		Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **0839**	Purge Stop Date: **12/18/12**	Time: **0859**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **13.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0843	**4**	**7.38**	**0.763**	**130.8**	**0.37**	**10.63**	**8.7**	
0847	**8**	**7.35**	**0.763**	**33.0**	**0.41**	**10.64**	**6.6**	
0849	**10**	**7.35**	**0.763**	**27.5**	**0.42**	**10.63**	**5.4**	
0851	**12**	**7.34**	**0.764**	**27.4**	**0.43**	**10.63**	**4.2**	
0855	**16**	**7.33**	**0.763**	**19.8**	**0.45**	**10.64**	**2.0**	
0859	**20**	**7.33**	**0.763**	**8.7**	**0.46**	**10.64**	**1.4**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(70)**	Location: **4377 NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW85(70)-G121812**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0825**	Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **0750**	Purge Stop Date: **12/18/12**	Time: **0825**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.55** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **35 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0758	8	7.76	0.716	162.8	0.35	10.33	102.2	
0800	10	7.69	0.716	127.0	0.33	10.34	92.1	
0805	15	7.57	0.719	99.0	0.32	10.34	70.8	
0810	20	7.50	0.721	59.6	0.31	10.36	57.8	
0815	25	7.42	0.724	31.3	0.30	10.35	45.0	
0820	30	7.39	0.726	31.2	0.29	10.35	37.6	
0825	35	7.37	0.727	29.8	0.29	10.35	33.7	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(130)**	Location: **4377 NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW85(130)-G121812**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0823**	Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **0750**	Purge Stop Date: **12/18/12**	Time: **0823**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **13.13** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **65 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0753	5	7.84	0.789	49.9	0.51	11.22	-154.3	
0755	10	7.82	0.789	83.5	0.42	11.25	-180.6	
0758	15	7.74	0.795	164.6	0.33	11.29	-212.6	
0800	20	7.26	0.883	100.6	0.29	11.32	-256.6	
0803	25	7.22	0.898	300.1	0.25	11.33	-320.6	
0805	30	7.21	0.906	174.2	0.24	11.33	-434.6	
0808	35	7.20	0.917	84.0	0.22	11.32	-484.6	
0810	40	7.20	0.921	65.0	0.21	11.33	-498.6	
0813	45	7.19	0.926	45.0	0.19	11.36	-507.8	
0815	50	7.18	0.93	34.2	0.18	11.36	-512.0	
0818	55	7.18	0.929	26.2	0.18	11.31	-512.7	
0821	60	7.18	0.931	26.8	0.17	11.33	-510.2	
0823	65	7.17	0.932	26.7	0.17	11.33	-512.2	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **East of Pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI1(16.5)-G121812**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1254**		Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **1230**	Purge Stop Date: **12/18/12**	Time: **1254**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.77** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1234	**2**	**7.02**	**1.332**	**177.6**	**0.45**	**14.50**	**-98.5**	
1238	**4**	**6.86**	**1.323**	**82.7**	**0.35**	**14.55**	**-102.8**	
1242	**6**	**6.79**	**1.334**	**22.8**	**0.25**	**14.60**	**-105.7**	
1246	**8**	**6.78**	**1.346**	**16.7**	**0.23**	**14.59**	**-106.2**	
1250	**10**	**6.76**	**1.351**	**7.6**	**0.19**	**14.60**	**-106.2**	
1254	**12**	**6.76**	**1.352**	**4.8**	**0.18**	**14.58**	**-106.4**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=6.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **East of Pond at 4377**	Page **1** of **1**

Sample ID: **ATR-ZVI1(34.5)-G121812**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1200**	Sample Collection Date: **12/18/2012**

Purge Start Date: **12/18/12**	Time: **1120**	Purge Stop Date: **12/18/12**	Time: **1200**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.63** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1125	5	7.24	0.564	127.5	0.94	13.39	-96.3	
1130	10	7.03	0.652	10.8	0.30	13.36	-96.8	
1135	15	6.89	0.758	3.7	0.23	13.43	-95.9	
1140	20	6.79	0.843	2.6	0.20	13.47	-92.3	
1145	25	6.70	0.945	2.3	0.17	13.52	-87.3	
1150	30	6.64	1.006	2.2	0.16	13.57	-85.4	
1155	35	6.61	1.047	1.8	0.15	13.60	-84.0	
1200	40	6.54	1.071	1.4	0.15	13.62	-83.1	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=5.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **East of Pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(17.5)-G121812**		Sampler : **Dewayne Gross**	
Sample Collection Time: **1250**		Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **1230**	Purge Stop Date: **12/18/12**	Time: **1250**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.66** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1235	**5**	**7.16**	**0.765**	**77.4**	**0.37**	**12.97**	**48.5**	
1240	**10**	**7.14**	**0.765**	**21.5**	**0.34**	**13.04**	**34.6**	
1245	**15**	**7.13**	**0.767**	**8.4**	**0.31**	**13.05**	**20.9**	
1250	**20**	**7.12**	**0.767**	**4.9**	**0.31**	**13.04**	**19.2**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **East of Pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(32.5)-G121812**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1205**		Sample Collection Date: **12/18/2012**	

Purge Start Date: **12/18/12**	Time: **1140**	Purge Stop Date: **12/18/12**	Time: **1205**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1145	**5**	**7.08**	**0.929**	**20.8**	**0.34**	**13.13**	**16.3**	
1150	**10**	**6.88**	**1.123**	**10.1**	**0.30**	**13.06**	**27.4**	
1155	**15**	**6.84**	**1.132**	**5.7**	**0.30**	**13.11**	**26.6**	
1200	**20**	**6.82**	**1.135**	**4.6**	**0.30**	**13.10**	**26.0**	
1205	**25**	**6.80**	**1.147**	**3.8**	**0.29**	**13.13**	**26.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/28/12**	Time: **0825**	Purge Stop Date: **12/28/12**	Time: **0940**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.96** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0830	5	6.53	1.273	20.0	0.85	13.61	220.0	
8035	10	5.76	1.422	8.9	0.65	13.84	167.8	
0840	15	5.54	1.444	9.2	0.59	13.81	132.2	
0845	20	NM	NM	NM	NM	NM	NM	*
0925	25	5.56	1.515	6.5	0.46	14.32	-46.8	
0930	30	5.55	1.495	5.9	0.28	14.13	-53.2	
0935	35	5.56	1.485	5.0	0.27	14.14	-56.9	
0940	40	5.56	1.483	5.0	0.25	14.15	-59.0	

Comments: **NM = Not Measured, SWL = Static Water Level**
***Questionable readings with instrument, changed batteries resumed purging @ 0920**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/28/12**	Time: **0945**	Purge Stop Date: **12/28/12**	Time: **1005**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0950	**5**	**7.05**	**0.367**	**1.3**	**0.49**	**12.46**	**-118.1**	
0955	**10**	**7.28**	**0.368**	**1.8**	**0.25**	**12.36**	**-149.1**	
1000	**15**	**7.29**	**0.367**	**1.9**	**0.20**	**12.29**	**-158.1**	
1005	**20**	**7.33**	**0.366**	**1.7**	**0.18**	**12.31**	**-162.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **12/28/12**	Time: **1040**	Purge Stop Date: **12/28/12**	Time: **1100**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.74** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1045	**5**	**7.38**	**0.275**	**2.7**	**0.71**	**12.73**	**-65.0**	
1050	**10**	**7.44**	**0.338**	**2.2**	**0.24**	**12.32**	**-133.7**	
1055	**15**	**7.50**	**0.340**	**1.8**	**0.19**	**12.30**	**-137.2**	
1100	**20**	**7.55**	**0.342**	**1.1**	**0.18**	**12.29**	**-142.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/27/12**	Time: **1450**	Purge Stop Date: **12/27/12**	Time: **1515**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.64** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1455	**5**	**6.91**	**0.598**	**160.2**	**0.90**	**14.33**	**210.6**	
1500	**10**	**6.81**	**0.613**	**56.2**	**0.76**	**14.32**	**207.7**	
1505	**15**	**6.57**	**0.619**	**4.5**	**0.36**	**14.46**	**179.9**	
1510	**20**	**6.56**	**0.621**	**2.4**	**0.35**	**14.34**	**160.3**	
1515	**25**	**6.57**	**0.620**	**0.0**	**0.34**	**14.35**	**152.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: 12/27/12	Time: **1525**	Purge Stop Date: **12/27/12**	Time: **1550**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.01** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1530	5	6.96	0.455	41.1	0.68	12.58	68.4	
1535	10	7.09	0.459	19.7	0.69	12.51	40.4	
1540	15	7.11	0.460	16.8	0.48	12.53	28.6	
1545	20	7.12	0.461	4.7	0.47	12.53	24.7	
1550	25	7.13	0.461	1.7	0.45	12.50	18.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **12/28/12**	Time: **1105**	Purge Stop Date: **12/28/12**	Time: **1125**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.92** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1110	**5**	**6.94**	**0.616**	**2.0**	**0.21**	**13.14**	**-98.1**	
1115	**10**	**6.91**	**0.606**	**1.7**	**0.18**	**12.85**	**-98.4**	
1120	**15**	**6.91**	**0.602**	**1.2**	**0.20**	**12.90**	**-97.4**	
1125	**20**	**6.91**	**0.600**	**1.1**	**0.21**	**12.95**	**-91.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/27/12**	Time: **1600**	Purge Stop Date: **12/27/12**	Time: **1625**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1605	**5**	**6.66**	**0.689**	**241.0**	**0.44**	**13.40**	**47.7**	
1610	**10**	**6.73**	**0.674**	**79.2**	**0.42**	**13.24**	**39.2**	
1615	**15**	**6.58**	**0.672**	**80.2**	**0.40**	**13.20**	**34.9**	
1620	**20**	**6.56**	**0.671**	**50.8**	**0.40**	**13.20**	**34.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**

Purge Start Date: **12/28/12**	Time: **1015**	Purge Stop Date: **12/28/12**	Time: **1035**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.76** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1020	**5**	**6.59**	**0.617**	**4.9**	**0.56**	**11.87**	**-21.1**	
1025	**10**	**6.57**	**0.609**	**2.8**	**0.31**	**11.93**	**-29.0**	
1030	**15**	**6.55**	**0.608**	**2.0**	**0.30**	**12.01**	**-35.0**	
1035	**20**	**6.55**	**0.607**	**1.8**	**0.29**	**12.12**	**-37.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **1/8/13**	Time: **1000**	Purge Stop Date: **1/8/13**	Time: **1025**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.68** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1000	**5**	**6.95**	**0.774**	**12.2**	**0.31**	**10.72**	**-53.5**	
1005	**10**	**6.71**	**0.989**	**2.1**	**0.30**	**10.64**	**-44.5**	
1010	**15**	**6.60**	**1.069**	**2.5**	**0.30**	**10.69**	**-42.8**	
1015	**20**	**6.57**	**1.059**	**2.1**	**0.29**	**10.81**	**-45.5**	
1020	**25**	**6.56**	**1.069**	**2.3**	**0.29**	**10.84**	**-48.0**	
1025	**30**	**6.56**	**1.066**	**2.2**	**0.29**	**10.89**	**-51.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **1/8/13**	Time: **1055**	Purge Stop Date: **1/8/13**	Time: **1115**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1100	**5**	**6.83**	**0.979**	**9.6**	**0.32**	**10.10**	**-72.3**	
1105	**10**	**6.88**	**0.982**	**2.7**	**0.31**	**10.17**	**-71.4**	
1110	**15**	**6.91**	**0.985**	**0.5**	**0.28**	**10.25**	**-70.4**	
1115	**20**	**6.93**	**0.987**	**0.2**	**0.27**	**10.22**	**-69.2**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(17.5)-G010813**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0950**	Sample Collection Date: **1/8/2012**	

Purge Start Date: **1/8/13**	Time: **0910**	Purge Stop Date: **1/8/13**	Time: **0950**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.65** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0915	**5**	**6.77**	**0.778**	**26.2**	**0.40**	**12.42**	**51.5**	
0920	**10**	**6.85**	**0.781**	**4.1**	**0.40**	**12.46**	**32.3**	
0925	**15**	**6.90**	**0.783**	**2.4**	**0.40**	**12.47**	**17.5**	
0930	**20**	**6.93**	**0.783**	**1.9**	**0.40**	**12.47**	**2.5**	
0935	**25**	**6.95**	**0.786**	**1.6**	**0.39**	**12.44**	**-10.3**	
0940	**30**	**6.97**	**0.787**	**1.4**	**0.38**	**12.49**	**-19.6**	
0945	**35**	**6.99**	**0.782**	**1.5**	**0.36**	**12.43**	**-27.5**	
0950	**40**	**7.00**	**0.788**	**1.5**	**0.38**	**12.46**	**-34.8**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(28.8)-G010813**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0905**	Sample Collection Date: **1/8/2012**	

Purge Start Date: **1/8/13**	Time: **0840**	Purge Stop Date: **1/8/13**	Time: **0905**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **11.74** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0845	**5**	**6.01**	**1.347**	**5.6**	**0.37**	**12.22**	**-114.5**	
0850	**10**	**6.22**	**1.370**	**5.6**	**0.32**	**12.27**	**-101.6**	
0855	**15**	**6.34**	**1.376**	**5.6**	**0.30**	**12.32**	**-83.1**	
0900	**20**	**6.37**	**1.369**	**5.5**	**0.30**	**12.30**	**-77.6**	
0905	**25**	**6.39**	**1.368**	**5.0**	**0.29**	**12.33**	**-71.4**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW59(29)-G010713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1423**	Sample Collection Date: **1/7/2012**	

Purge Start Date: **1/7/13**	Time: **1400**	Purge Stop Date: **1/7/13**	Time: **1423**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.00** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **23 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp. (°C)	ORP (mV)	Remarks
1405	5	5.38	1.858	8.2	0.49	14.28	100.1	
1408	8	5.29	1.876	7.4	0.45	14.28	80.7	
1411	11	5.29	1.890	7.1	0.43	14.28	60.2	
1414	14	5.26	1.885	6.9	0.44	14.30	68.0	
1417	17	5.28	1.880	6.3	0.42	14.28	62.7	
1420	20	5.28	1.866	6.2	0.42	14.33	58.5	
1423	23	5.28	1.864	6.1	0.41	14.31	55.7	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=5.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **1/7/13**	Time: **1440**	Purge Stop Date: **1/7/13**	Time: **1503**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.64** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **23 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1445	**5**	**6.52**	**0.480**	**4.2**	**0.41**	**12.63**	**-19.6**	
1448	**8**	**6.59**	**0.480**	**4.4**	**0.40**	**12.59**	**-24.2**	
1451	**11**	**6.74**	**0.481**	**1.8**	**0.38**	**12.59**	**-32.1**	
1454	**14**	**6.84**	**0.481**	**1.0**	**0.37**	**12.62**	**-37.3**	
1457	**17**	**6.92**	**0.482**	**0.7**	**0.38**	**12.62**	**-41.1**	
1500	**20**	**6.95**	**0.483**	**0.6**	**0.37**	**12.59**	**-42.7**	
1503	**23**	**6.97**	**0.483**	**0.7**	**0.37**	**12.60**	**-43.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **1/7/13**	Time: **1400**	Purge Stop Date: **1/7/13**	Time: **1425**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.94** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1405	5	7.43	0.327	8.4	0.53	13.16	-124.6	
1410	10	7.57	0.331	8.0	0.34	13.38	-150.3	
1415	15	7.62	0.331	7.8	0.28	13.23	-156.4	
1420	20	7.64	0.331	7.8	0.26	13.29	-161.4	
1425	25	7.65	0.332	8.0	0.26	13.31	-163.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW81(27)-G010713**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1630**	Sample Collection Date: **1/7/2012**	

Purge Start Date: **1/7/13**	Time: **1600**	Purge Stop Date: **1/7/13**	Time: **1630**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1605	5	6.68	0.592	20.6	0.34	14.54	-39.9	
1610	10	6.68	0.607	13.0	0.24	14.49	-47.8	
1615	15	6.66	0.607	12.0	0.23	14.50	-51.0	
1620	20	6.66	0.607	8.5	0.22	14.53	-52.7	
1625	25	6.66	0.609	8.4	0.22	14.50	-55.1	
1630	30	6.65	0.611	8.3	0.22	14.51	-55.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.75 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **1/7/13**	Time: **1530**	Purge Stop Date: **1/7/13**	Time: **1550**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.09** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1535	**5**	**7.52**	**0.354**	**26.4**	**0.35**	**13.06**	**-127.4**	
1540	**10**	**7.55**	**0.354**	**14.1**	**0.25**	**13.00**	**-138.0**	
1545	**15**	**7.58**	**0.352**	**10.7**	**0.21**	**13.05**	**-144.4**	
1550	**20**	**7.59**	**0.352**	**10.0**	**0.20**	**13.08**	**-146.9**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM1-G010713**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1510**		Sample Collection Date: **1/7/2013**	

Purge Start Date: **1/7/13**	Time: **1435**	Purge Stop Date: **1/7/13**	Time: **1505**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1440	**5**	**6.98**	**0.594**	**14.1**	**5.78**	**14.42**	**-68.7**	
1445	**10**	**6.98**	**0.582**	**21.3**	**1.70**	**14.33**	**-73.0**	
1450	**15**	**6.99**	**0.561**	**10.1**	**0.72**	**14.46**	**-85.2**	
1455	**20**	**7.00**	**0.551**	**9.6**	**0.74**	**14.56**	**-88.3**	
1500	**25**	**6.99**	**0.542**	**7.5**	**0.77**	**14.50**	**-89.6**	
1505	**30**	**7.01**	**0.543**	**5.3**	**0.75**	**14.50**	**-90.4**	
1510	**dry**	**dry**	**dry**	**dry**	**dry**	**dry**	**dry**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.0 mg/L**
Purged dry after 30 gallons, sampled @ 1510 after recovery.

Completed by: JGS
Checked by: RLB
Rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-PM2-G010713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1550**	Sample Collection Date: **1/7/2013**	

Purge Start Date: **1/7/13**	Time: **1510**	Purge Stop Date: **1/7/13**	Time: **1550**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.85** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1515	2.5	6.63	0.781	215.4	0.53	13.62	10.9	
1520	5	6.62	0.760	78.5	0.49	13.57	8.0	
1525	7.5	6.63	0.743	33.9	0.45	13.63	5.5	
1530	10	6.63	0.742	22.1	0.43	13.58	4.4	
1535	12.5	6.64	0.735	14.3	0.41	13.67	2.4	
1540	15	6.64	0.732	10.7	0.42	13.69	1.6	
1545	17.5	6.64	0.730	7.6	0.42	13.76	1.3	
1550	20	6.64	0.728	4.3	0.41	13.70	0.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.5 mg/L**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM3-G010713**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1620**		Sample Collection Date: **1/7/2013**	

Purge Start Date: **1/7/13**	Time: **1600**	Purge Stop Date: **1/7/13**	Time: **1620**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.85** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1605	**5**	**6.52**	**0.759**	**88.3**	**0.44**	**11.82**	**38.5**	
1610	**10**	**6.48**	**0.761**	**14.7**	**0.42**	**11.95**	**36.5**	
1615	**15**	**6.48**	**0.761**	**8.3**	**0.41**	**12.02**	**36.0**	
1620	**20**	**6.47**	**0.760**	**4.6**	**0.41**	**12.07**	**35.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **East of pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(16.5)-G010813**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1115**		Sample Collection Date: **1/8/2012**	

Purge Start Date: **1/8/13**	Time: **1055**	Purge Stop Date: **1/8/13**	Time: **1115**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.90** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1100	**5**	**6.94**	**0.899**	**49.7**	**0.32**	**13.08**	**-127.8**	
1105	**10**	**6.95**	**0.894**	**14.9**	**0.21**	**13.13**	**-132.3**	
1110	**15**	**6.95**	**0.891**	**5.1**	**0.18**	**13.15**	**-133.4**	
1115	**20**	**6.96**	**0.892**	**4.8**	**0.18**	**13.15**	**-133.5**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=7.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI2(17.5)-G010813**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1045**	Sample Collection Date: **1/8/2012**	

Purge Start Date: **1/8/13**	Time: **1000**	Purge Stop Date: **1/8/13**	Time: **1045**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.76** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **45 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1005	**5**	**7.33**	**0.453**	**8.1**	**0.52**	**13.13**	**-70.1**	
1010	**10**	**7.30**	**0.466**	**2.0**	**0.24**	**13.10**	**-91.1**	
1015	**15**	**7.27**	**0.477**	**1.3**	**0.20**	**13.15**	**-94.0**	
1020	**20**	**7.25**	**0.486**	**1.1**	**0.19**	**13.22**	**-94.3**	
1025	**25**	**7.19**	**0.514**	**0.9**	**0.17**	**13.21**	**-93.1**	
1030	**30**	**7.10**	**0.557**	**0.9**	**0.16**	**13.25**	**-91.2**	
1035	**35**	**7.04**	**0.584**	**0.7**	**0.16**	**13.26**	**-89.5**	
1040	**40**	**7.03**	**0.605**	**0.6**	**0.15**	**13.22**	**-88.5**	
1045	**45**	**7.03**	**0.623**	**0.6**	**0.15**	**13.23**	**-88.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=0.5 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI2(17.5)-G010813**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0945**	Sample Collection Date: **1/8/2012**	

Purge Start Date: **1/8/13**	Time: **0925**	Purge Stop Date: **1/8/13**	Time: **0945**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.77** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0930	**5**	**7.11**	**0.576**	**90.2**	**0.45**	**12.97**	**-99.7**	
0935	**10**	**7.12**	**0.574**	**13.3**	**0.26**	**12.98**	**-111.4**	
0940	**15**	**7.13**	**0.572**	**7.4**	**0.25**	**12.98**	**-115.6**	
0945	**20**	**7.14**	**0.571**	**4.8**	**0.24**	**12.96**	**-116.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.5 mg/L**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **East of pond at 4377**	Page **1** of **1**

Sample ID: **ATR-ZVI2(32.5)-G010813**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **0915**	Sample Collection Date: **1/8/2012**

Purge Start Date: **1/8/13**	Time: **0845**	Purge Stop Date: **1/8/13**	Time: **0915**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.68** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0850	5	6.68	0.709	9.2	0.67	13.34	-38.8	
0855	10	6.80	0.707	5.1	0.34	13.39	-57.8	
0900	15	6.83	0.692	4.1	0.27	13.40	-65.2	
0905	20	6.85	0.685	3.5	0.24	13.40	-69.6	
0910	25	6.87	0.686	3.3	0.22	13.43	-72.9	
0915	30	6.88	0.687	2.7	0.20	13.43	-74.9	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.1 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-13**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **0939**	Purge Stop Date: **2/5/13**	Time: **1000**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Disposable Bailer; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **2.4 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0940	**0.8**	**7.37**	**0.514**	**NM**	**3.72**	**12.40**	**-16.9**	
0950	**1.6**	**7.55**	**0.521**	**NM**	**3.48**	**12.21**	**-5.0**	
1000	**2.4**	**7.49**	**0.523**	**NM**	**2.07**	**12.36**	**-16.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-14**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **0957**	Purge Stop Date: **2/5/13**	Time: **1017**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.00** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1002	**5**	**7.49**	**0.493**	**240.0**	**1.30**	**12.72**	**20.0**	
1007	**10**	**7.50**	**0.505**	**102.0**	**0.98**	**12.79**	**-2.2**	
1012	**15**	**7.51**	**0.508**	**29.6**	**0.95**	**12.82**	**-10.6**	
1017	**20**	**7.50**	**0.509**	**6.7**	**0.92**	**12.86**	**-17.5**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(16.4)**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **1105**	Purge Stop Date: **2/5/13**	Time: **1125**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **7.12** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1110	**5**	**7.49**	**0.555**	**6.4**	**0.90**	**11.34**	**-36.0**	
1115	**10**	**7.49**	**0.552**	**0.0**	**0.84**	**11.42**	**-50.0**	
1120	**15**	**7.49**	**0.556**	**0.0**	**0.79**	**11.45**	**-59.5**	
1125	**20**	**7.51**	**0.557**	**0.0**	**0.78**	**11.36**	**-63.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)** | Location: **4377 N Old US 31, East of TORX facility** | Page **1** of **1**

Sample ID: **Not sampled** | Sampler: **Gregg Schoenberger**

Sample Collection Time: **Not sampled** | Sample Collection Date: **Not sampled**

Purge Start Date: **2/5/13** | Time: **1030** | Purge Stop Date: **2/5/13** | Time: **1050**

Casing Diameter: **2 Inch** | Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.65** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1035	**5**	**7.46**	**0.549**	**9.0**	**0.90**	**12.45**	**-65.3**	
1040	**10**	**7.51**	**0.548**	**0.0**	**0.94**	**12.52**	**-99.3**	
1045	**15**	**7.54**	**0.548**	**0.0**	**0.93**	**12.55**	**-110.0**	
1050	**20**	**7.55**	**0.549**	**0.0**	**0.90**	**12.55**	**-118.0**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **1035**	Purge Stop Date: **2/5/13**	Time: **1053**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1038	3	6.97	1.032	NM	0.44	13.08	-89.1	
1041	6	6.93	1.023	NM	0.36	13.06	-89.7	
1044	9	6.91	0.966	NM	0.30	13.14	-92.7	
1047	12	6.89	0.958	NM	0.27	13.13	-93.5	
1050	15	6.88	0.953	NM	0.26	13.13	-94.1	
1053	18	6.88	0.952	NM	0.25	13.15	-94.9	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW59(29)-G020413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1630**	Sample Collection Date: **2/4/2013**	

Purge Start Date: **2/4/13**	Time: **1600**	Purge Stop Date: **2/4/13**	Time: **1630**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.00** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1605	**5**	**6.89**	**1.206**	**14.8**	**3.57**	**13.72**	**-125.4**	
1610	**10**	**6.85**	**1.261**	**15.9**	**1.02**	**13.84**	**-131.1**	
1615	**15**	**6.82**	**1.275**	**10.6**	**0.60**	**13.83**	**-132.1**	
1620	**20**	**6.81**	**1.283**	**6.5**	**0.58**	**13.88**	**-132.5**	
1625	**25**	**6.81**	**1.284**	**4.8**	**0.55**	**13.85**	**-133.3**	
1630	**30**	**6.81**	**1.285**	**4.5**	**0.55**	**13.84**	**-132.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **0910**	Purge Stop Date: **2/5/13**	Time: **0925**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0913	**3**	**7.34**	**0.393**	**NM**	**0.27**	**13.23**	**-189.5**	
0916	**6**	**7.38**	**0.394**	**NM**	**0.25**	**13.05**	**-192.7**	
0919	**9**	**7.39**	**0.394**	**NM**	**0.24**	**13.01**	**-192.7**	
0922	**12**	**7.40**	**0.394**	**NM**	**0.24**	**13.00**	**-193.0**	
0925	**15**	**7.40**	**0.394**	**NM**	**0.23**	**13.00**	**-193.4**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/4/13**	Time: **1432**	Purge Stop Date: **2/4/13**	Time: **1444**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1435	**3**	**7.61**	**0.386**	**12.4**	**0.32**	**13.75**	**-171.4**	
1438	**6**	**7.61**	**0.391**	**2.1**	**0.33**	**13.42**	**-176.2**	
1441	**9**	**7.61**	**0.391**	**0.0**	**0.33**	**13.09**	**-175.1**	
1444	**12**	**7.59**	**0.392**	**0.0**	**0.33**	**13.15**	**-175.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-80(19)**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW80(19)-G020413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1445**	Sample Collection Date: **2/4/2013**	

Purge Start Date: **2/4/13**	Time: **1400**	Purge Stop Date: **2/4/13**	Time: **1445**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **45 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1405	**5**	**7.60**	**0.350**	**1075.0**	**10.30**	**11.37**	**-160.5**	
1410	**10**	**7.43**	**0.366**	**249.0**	**7.29**	**11.70**	**-171.5**	
1415	**15**	**7.50**	**0.373**	**159.6**	**4.39**	**11.82**	**-176.9**	
1420	**20**	**7.89**	**0.375**	**105.4**	**2.95**	**12.02**	**-175.5**	
1425	**25**	**7.95**	**0.378**	**71.6**	**2.22**	**12.07**	**-176.9**	
1430	**30**	**7.96**	**0.380**	**59.3**	**1.87**	**12.25**	**-179.4**	
1435	**35**	**7.95**	**0.381**	**57.6**	**1.64**	**12.22**	**-181.0**	
1440	**40**	**7.98**	**0.382**	**46.4**	**1.63**	**12.26**	**-182.4**	
1445	**45**	**7.99**	**0.383**	**45.4**	**1.62**	**12.25**	**-181.8**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW81(27)-G020513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0851**	Sample Collection Date: **2/5/2013**	

Purge Start Date: **2/5/13**	Time: **0830**	Purge Stop Date: **2/5/13**	Time: **0851**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **21 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0832	3	7.30	0.529	105.5	0.94	13.91	-72.6	
0835	6	7.23	0.550	62.2	0.54	14.00	-130.5	
0838	9	7.19	0.556	31.7	0.44	14.03	-145.5	
0841	12	7.12	0.563	21.9	0.37	14.13	-151.4	
0844	15	7.11	0.563	20.7	0.36	14.14	-152.3	
0847	18	7.09	0.564	19.7	0.35	14.17	-152.7	
0850	21	7.08	0.565	8.7	0.34	14.13	-153.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **Not sampled**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **Not sampled**	Sample Collection Date: **Not sampled**	

Purge Start Date: **2/5/13**	Time: **0830**	Purge Stop Date: **2/5/13**	Time: **0900**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.10** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0835	**5**	**7.40**	**0.393**	**236.0**	**1.99**	**12.31**	**-5.5**	
0840	**10**	**7.42**	**0.393**	**84.0**	**0.88**	**12.34**	**-56.5**	
0845	**15**	**7.43**	**0.393**	**23.2**	**0.85**	**12.38**	**-107.5**	
0850	**20**	**7.64**	**0.393**	**13.8**	**0.84**	**12.54**	**-126.5**	
0855	**25**	**7.65**	**0.393**	**12.6**	**0.80**	**12.59**	**-140.5**	
0900	**30**	**7.66**	**0.394**	**3.1**	**0.77**	**12.52**	**-147.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **OW-25N**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **Not sampled**		Sampler: **Dwayne Gross**	
Sample Collection Time: **Not sampled**		Sample Collection Date: **Not sampled**	

Purge Start Date: **2/4/13**	Time: **1402**	Purge Stop Date: **2/4/13**	Time: **1418**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 5 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1402	3	8.10	0.258	33.2	0.66	14.58	-178.6	
1405	6	7.96	0.266	11.8	0.48	14.61	-190.9	
1408	9	7.89	0.271	4.9	0.42	14.61	-195.8	
1412	12	7.86	0.273	2.0	0.39	14.60	-199.3	
1415	15	7.83	0.275	0.1	0.36	14.63	-202.3	
1418	18	7.81	0.276	0.0	0.34	14.63	-204.5	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-PM1-G020413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1545**	Sample Collection Date: **2/4/2013**	

Purge Start Date: **2/4/13**	Time: **1505**	Purge Stop Date: **2/4/13**	Time: **1530**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.20** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1510	**5**	**7.69**	**0.850**	**314.2**	**2.90**	**12.87**	**-155.1**	
1515	**10**	**7.77**	**0.670**	**247.2**	**2.50**	**13.27**	**-140.2**	
1520	**15**	**7.80**	**0.660**	**12.4**	**1.88**	**13.27**	**-153.0**	
1525	**20**	**7.81**	**0.657**	**10.6**	**1.76**	**13.32**	**-155.9**	
1530	**dry**	**dry**	**dry**	**dry**	**dry**	**dry**	**dry**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.5 mg/L**
Well dry @ 25 gallons, Restarted pump and sampled at 1545

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM2-G020413**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1547**		Sample Collection Date: **2/4/2013**	

Purge Start Date: **2/4/13**	Time: **1505**	Purge Stop Date: **2/4/13**	Time: **1547**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **42 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1508	3	6.93	0.759	840.6	0.44	13.10	-125.9	
1511	6	6.90	0.754	784.4	0.36	13.20	-131.4	
1514	9	6.88	0.754	762.3	0.35	13.18	-133.2	
1517	12	6.85	0.752	741.1	0.34	13.24	-134.8	
1520	15	6.75	0.745	1165.4	0.81	13.88	-126.6	
1523	18	6.86	0.728	888.4	0.51	13.91	-134.0	
1526	21	6.87	0.703	294.4	0.36	13.90	-135.1	
1529	24	6.86	0.689	149.9	0.33	13.99	-134.6	
1532	27	6.86	0.679	81.9	0.36	13.99	-133.5	
1535	30	6.86	0.674	61.4	0.32	13.98	-134.8	
1538	33	6.86	0.666	30.9	0.30	13.96	-134.0	
1541	36	6.86	0.662	23.2	0.29	14.03	-133.9	
1544	39	6.86	0.658	11.6	0.27	14.01	-134.5	
1547	42	6.86	0.655	7.0	0.27	14.02	-133.9	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=4.0 mg/L**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM3-G020413**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1635**		Sample Collection Date: **2/4/2013**	

Purge Start Date: **2/4/13**	Time: **1605**	Purge Stop Date: **2/4/13**	Time: **1635**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1608	3	6.61	0.646	240.0	0.27	13.14	-93.8	
1611	6	6.60	0.645	155.4	0.26	13.31	-92.3	
1614	9	6.60	0.641	116.9	0.24	13.48	-91.9	
1617	12	6.60	0.639	90.4	0.25	13.58	-92.1	
1620	15	6.60	0.636	57.3	0.25	13.68	-92.3	
1623	18	6.60	0.634	50.5	0.24	13.68	-92.4	
1626	21	6.60	0.633	32.2	0.24	13.71	-92.6	
1629	24	6.59	0.632	23.7	0.23	13.68	-92.7	
1632	27	6.59	0.631	18.1	0.23	13.70	-92.7	
1635	30	6.59	0.630	9.8	0.22	13.70	-92.9	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-1**	Location: **Behind the TORX facility**		Page **1** of **1**
Sample ID: **ATR-INJ1-G030513**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1115**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1046**	Purge Stop Date: **3/5/13**	Time: **1115**

Casing Diameter:. **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.78** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1046	**0.5**	**5.31**	**1.436**	**22.6**	**2.50**	**9.16**	**-36.7**	
1100	**1.0**	**5.39**	**1.654**	**20.9**	**2.88**	**9.55**	**-54.2**	
1115	**1.5**	**5.29**	**2.283**	**463.0**	**2.89**	**10.38**	**-51.5**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-2**	Location: **Behind the TORX facility**		Page **1** of **1**
Sample ID: **ATR-INJ2-G030613**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1400**		Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1340**	Purge Stop Date: **3/6/13**	Time: **1400**

Casing Diameter: **1.0 inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.31** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.2 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1340	**0.8**	**5.06**	**2.654**	**109.2**	**2.26**	**12.43**	**-32.8**	
1350	**1.2**	**5.03**	**2.754**	**97.0**	**1.05**	**12.86**	**-22.2**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **INJ-3**	Location: **Behind the TORX facility**		Page **1** of **1**
Sample ID: **ATR-INJ3-G030513**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1345**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1310**	Purge Stop Date: **3/5/13**	Time: **1345**

Casing Diameter: **1.0 inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.68*** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.2 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1310	**0.4**	**4.80**	**1.831**	**400.0**	**2.78**	**13.16**	**32.9**	
1325	**0.8**	**4.80**	**1.982**	**338.0**	**2.53**	**12.46**	**20.8**	
1340	**1.2**	**4.79**	**1.986**	**370.0**	**2.64**	**13.01**	**19.6**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**
*** - depth to water measured on 03/04/2013**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-6C**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW6C-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0907**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **0840**	Purge Stop Date: **3/5/13**	Time: **0907**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.86** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **27 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0843	3	7.13	0.549	24.0	0.61	14.87	204.0	
0846	6	7.11	0.551	3.7	0.46	14.90	154.5	
0849	9	7.10	0.552	3.4	0.34	14.94	27.4	
0852	12	7.10	0.551	0.0	0.29	15.00	12.5	
0855	15	7.10	0.552	0.0	0.29	15.00	2.8	
0858	18	7.10	0.552	0.0	0.23	15.00	-11.7	
0901	21	7.11	0.551	0.0	0.25	15.01	-20.1	
0904	24	7.11	0.551	0.0	0.22	15.02	-23.9	
0907	27	7.11	0.550	0.0	0.22	15.03	-26.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-11**	Location: **East of TORX facility, across Old US 31 N**		Page **1** of **1**
Sample ID: **ATR-MW11-G030513**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1420**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1350**	Purge Stop Date: **3/5/13**	Time: **1420**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.91** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.0 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1350	**0.3**	**7.34**	**0.598**	**423.5**	**4.71**	**12.79**	**30.0**	
1400	**0.6**	**7.24**	**0.619**	**1157.0**	**3.91**	**12.26**	**32.5**	
1410	**1.0**	**7.21**	**0.669**	**1150.3**	**3.77**	**11.98**	**38.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-14**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW14-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1513**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1458**	Purge Stop Date: **3/5/13**	Time: **1513**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.42** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1501	3	7.19	0.473	0.7	0.43	12.78	13.4	
1504	6	7.22	0.501	0.0	0.25	12.89	7.8	
1507	9	7.22	0.509	0.0	0.19	12.91	10.1	
1510	12	7.21	0.511	0.0	0.18	12.96	12.5	
1513	15	7.22	0.510	0.0	0.17	12.95	13.0	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-15**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW15-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0845**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **0830**	Purge Stop Date: **3/6/13**	Time: **0845**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.37** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **22 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0832	3	7.26	0.482	10.6	0.38	12.88	-34.9	
0834	6	7.26	0.482	4.2	0.32	12.88	-35.1	
0836	9	7.26	0.483	0.7	0.28	12.87	-35.2	
0838	12	7.26	0.483	0.0	0.27	12.86	-35.2	
0840	15	7.26	0.483	0.0	0.26	12.88	-35.3	
0842	18	7.25	0.483	0.0	0.25	12.86	-35.3	
0844	22	7.26	0.483	0.0	0.24	12.85	-35.3	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW16-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1500**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1445**	Purge Stop Date: **3/6/13**	Time: **1500**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **10.31** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1448	3	6.90	0.988	0.0	0.12	13.11	-116.3	
1451	6	6.81	1.125	0.0	0.12	13.14	-114.5	
1454	9	6.76	1.124	0.0	0.12	13.17	-112.9	
1457	12	6.75	1.124	0.0	0.11	13.16	-113.0	
1500	15	6.76	1.123	0.0	0.11	13.16	-113.3	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW17-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1528**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1510**	Purge Stop Date: **3/6/13**	Time: **1528**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.08** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1513	3	7.12	0.744	54.7	0.41	11.36	-82.6	
1516	6	7.12	0.741	34.7	0.33	11.42	-79.4	
1519	9	7.12	0.743	19.2	0.20	11.36	-76.3	
1521	12	7.11	0.744	10.5	0.17	11.35	-73.7	
1524	15	7.11	0.746	4.3	0.15	11.33	-71.0	
1528	18	7.11	0.748	1.8	0.14	11.36	-69.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-24(55.4)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW24(55.4)-G030513**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1520**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1500**	Purge Stop Date: **3/5/13**	Time: **1520**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **21.64** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1505	**5**	**6.94**	**0.892**	**0.0**	**1.09**	**12.08**	**-10.8**	
1510	**10**	**6.99**	**0.928**	**0.0**	**0.30**	**12.19**	**-33.1**	
1515	**15**	**7.00**	**0.921**	**0.0**	**0.24**	**12.20**	**-43.1**	
1520	**20**	**7.00**	**0.977**	**0.0**	**0.22**	**12.27**	**-46.1**	

Comments: **NM = Not Measured, SWL = Statistic Water Level Fe=NM**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(16)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW25(16)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0904**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **0850**	Purge Stop Date: **3/6/13**	Time: **0904**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **6.04** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0852	2	7.25	0.544	28.8	0.23	10.46	-24.3	
0854	4	7.25	0.541	11.6	0.20	10.69	NM	
0856	6	7.26	0.539	0.3	0.19	10.77	9.4	
0858	8	7.25	0.542	0.0	0.19	10.76	-0.4	
0900	10	7.27	0.542	0.0	0.18	10.82	-4.7	
0902	12	7.27	0.544	0.0	0.18	10.82	-9.7	
0904	14	7.27	0.546	0.0	0.17	10.79	-12.3	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(32.6)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW25(32.6)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0925**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **0910**	Purge Stop Date: **3/6/13**	Time: **0925**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0912	3	7.46	0.462	4.8	1.32	12.16	-15.0	
0915	6	7.40	0.470	0.0	0.34	12.30	-30.2	
0918	9	7.40	0.468	0.0	0.28	12.27	-37.9	
0921	12	7.40	0.467	0.0	0.26	12.22	-41.9	
0924	15	7.40	0.466	0.0	0.25	12.25	-45.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(17.5)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0943**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **0933**	Purge Stop Date: **3/6/13**	Time: **0943**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.41** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0935	2	7.30	0.537	10.9	0.21	12.34	-84.6	
0937	4	7.32	0.535	1.1	0.21	12.42	-95.0	
0939	6	7.33	0.534	0.0	0.19	12.35	-98.6	
0941	8	7.33	0.534	0.0	0.18	12.41	-103.0	
0943	10	7.33	0.535	0.0	0.18	12.42	-106.7	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=1.5 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(28.8)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0959**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **0949**	Purge Stop Date: **3/6/13**	Time: **0959**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.34** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0951	2	6.78	0.927	7.0	0.15	12.91	-86.7	
0953	4	6.76	0.954	0.2	0.15	12.94	-83.5	
0955	6	6.78	0.946	0.0	0.14	12.98	-82.4	
0957	8	6.78	0.942	0.0	0.14	13.01	-82.0	
0959	10	6.79	0.941	0.0	0.14	12.99	-82.1	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=4.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(18)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW27(18)-G030513**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1550**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1535**	Purge Stop Date: **3/5/13**	Time: **1550**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **5.39** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1540	**5**	**7.21**	**0.618**	**0.0**	**0.23**	**10.08**	**0.1**	
1545	**10**	**7.19**	**0.617**	**0.0**	**0.20**	**10.19**	**-3.3**	
1550	**15**	**7.18**	**0.616**	**0.0**	**0.18**	**10.15**	**-5.6**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: RLB
Checked by: WDG

WDG

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(53.03)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW27(53.03)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1600**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1535**	Purge Stop Date: **3/5/13**	Time: **1600**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1540	5	7.02	0.819	6.5	0.58	10.90	41.6	
1545	10	7.00	0.871	0.0	0.25	11.01	43.9	
1550	15	7.00	0.878	0.0	0.20	10.98	45.4	
1555	20	6.99	0.878	0.0	0.19	10.96	47.0	
1600	25	6.99	0.879	0.0	0.18	10.91	47.9	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-30(41.1)**	Location: **Airvac (4081 N Old US 31)**		Page **1** of **1**
Sample ID: **ATR-MW30(41.1)-G030513**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1445**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1430**	Purge Stop Date: **3/5/13**	Time: **1445**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **21.56** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1433	3	7.13	0.649	7.8	0.32	11.43	39.9	
1436	6	7.12	0.652	0.0	0.22	11.47	37.1	
1439	9	7.12	0.654	0.0	0.18	11.51	33.9	
1442	12	7.12	0.654	0.0	0.17	11.52	34.5	
1445	15	7.12	0.654	0.0	0.16	11.51	32.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW59(29)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1240**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1226**	Purge Stop Date: **3/6/13**	Time: **1240**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.81** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1228	2	5.90	1.182	11.0	0.14	13.61	-50.1	
1230	4	6.06	1.068	12.9	0.14	13.69	-61.6	
1232	6	6.09	1.045	13.9	0.13	13.71	-67.0	
1234	8	6.11	1.034	13.8	0.13	13.68	-70.8	
1236	10	6.12	1.026	14.5	0.13	13.63	-73.1	
1238	12	6.13	1.023	14.0	0.13	13.63	-75.0	
1240	14	6.12	1.024	14.4	0.13	13.64	-75.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=3.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW59(46)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1141**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1126**	Purge Stop Date: **3/5/13**	Time: **1141**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **15.41** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1129	3	7.35	0.364	11.7	0.13	13.23	-159.6	
1132	6	7.38	0.364	2.1	0.12	13.19	-159.7	
1135	9	7.39	0.364	0.0	0.12	13.24	-162.9	
1138	12	7.40	0.365	0.0	0.11	13.27	-163.8	
1141	15	7.41	0.364	0.0	0.11	13.21	-164.5	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW60(38)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1210**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1155**	Purge Stop Date: **3/5/13**	Time: **1210**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **14.50** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1158	3	7.63	0.241	7.6	0.19	13.63	-129.4	
1201	6	7.51	0.337	0.0	0.14	13.71	-154.9	
1204	9	7.53	0.342	0.0	0.10	13.69	-158.7	
1207	12	7.54	0.344	0.0	0.10	13.73	-160.4	
1210	15	7.55	0.345	0.0	0.09	13.70	-161.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-65(32)**	Location: **Inside the TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW65(32)-G030513**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1135**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1110**	Purge Stop Date: **3/5/13**	Time: **1135**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.80** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **1.8 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1110	0.6	7.58	0.434	61.5	3.54	17.06	-62.1	
1120	1.2	7.54	0.432	242.6	4.56	16.47	-76.4	
1130	1.8	7.38	0.434	281.9	3.44	16.23	-99.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-72(32)**	Location: **Inside the Torx Facility**	Page **1** of **1**
Sample ID: **ATR-MW72(32)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1100**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1038**	Purge Stop Date: **3/6/13**	Time: **1100**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.22** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0 gallon/minute**

Total Quantity of Water Bailed: **2.1 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1038	**0.7**	**6.96**	**0.696**	**110.6**	**2.48**	**15.75**	**-45.9**	
1048	**1.4**	**6.95**	**0.699**	**318.4**	**2.54**	**16.07**	**-56.8**	
1058	**2.1**	**6.98**	**0.721**	**753.8**	**2.83**	**16.20**	**-56.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-76(30)**	Location: **Inside the TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW76(30)-G030513**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1101**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1045**	Purge Stop Date: **3/4/13**	Time: **1101**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.54** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **6 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1049	2	6.65	0.814	158.6	0.83	16.42	28.6	
1053	4	6.64	0.815	31.3	0.68	16.44	32.0	
1057	6	6.63	0.815	2.1	0.62	16.47	33.7	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-77(41)**	Location: **Inside the TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW77(41)-G030513**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1031**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1015**	Purge Stop Date: **3/5/13**	Time: **1031**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.78** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1019	**2**	**7.62**	**0.339**	**23.5**	**0.59**	**14.73**	**-113.4**	
1023	**4**	**7.61**	**0.341**	**11.9**	**0.32**	**14.73**	**-120.5**	
1027	**6**	**7.61**	**0.340**	**0.0**	**0.36**	**14.73**	**-127.5**	
1031	**8**	**7.61**	**0.340**	**0.0**	**0.55**	**14.74**	**-130.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-78(35)**	Location: **Inside the TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW78(35)-G030513**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0955**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **0934**	Purge Stop Date: **3/5/13**	Time: **0955**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.21** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **11 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0936	1	7.33	0.423	240.7	0.73	15.69	-54.7	
0938	2	7.30	0.424	154.0	0.41	15.62	-54.3	
0940	3	7.30	0.425	117.0	0.33	15.60	-54.6	
0942	4	7.29	0.425	80.5	0.32	15.60	-55.0	
0944	5	7.29	0.425	64.1	0.29	15.60	-55.2	
0946	6	7.29	0.425	44.0	0.31	15.60	-55.6	
0948	7	7.29	0.425	42.0	0.28	15.59	-55.4	
0950	8	7.29	0.425	29.6	0.29	15.59	-56.1	
0952	9	7.29	0.425	27.8	0.29	15.59	-55.1	
0954	10	7.29	0.425	13.6	0.29	15.60	-56.3	
0955	11	7.29	0.425	8.7	0.30	15.60	-56.8	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-79(30)** | Location: **Inside the TORX facility** | Page **1** of **1**

Sample ID: **ATR-MW79(30)-G030513** | Sampler: **Gregg Schoenberger**

Sample Collection Time: **0913** | Sample Collection Date: **3/5/2013**

Purge Start Date: **3/5/13** | Time: **0855** | Purge Stop Date: **3/5/13** | Time: **0913**

Casing Diameter: **2 Inch** | Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.60** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **9 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0857	**1**	**7.20**	**0.458**	**374.0**	**0.88**	**15.41**	**-65.8**	
0859	**2**	**7.22**	**0.440**	**246.0**	**0.59**	**15.49**	**-76.5**	
0901	**3**	**7.23**	**0.426**	**141.0**	**0.50**	**15.54**	**-86.1**	
0903	**4**	**7.23**	**0.421**	**84.0**	**0.53**	**15.56**	**-91.5**	
0905	**5**	**7.23**	**0.420**	**50.0**	**0.50**	**15.57**	**-97.2**	
0907	**6**	**7.23**	**0.418**	**29.0**	**0.50**	**15.57**	**-103.1**	
0909	**7**	**7.23**	**0.418**	**19.9**	**0.49**	**15.58**	**-107.2**	
0911	**8**	**7.24**	**0.418**	**13.1**	**0.48**	**15.58**	**-111.4**	
0913	**9**	**7.23**	**0.418**	**8.3**	**0.43**	**15.59**	**-113.4**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**		Page **1** of **1**
Sample ID: **ATR-MW81(27)-G030613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1424**		Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1400**	Purge Stop Date: **3/6/13**	Time: **1424**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.24** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1406	**6**	**6.67**	**0.512**	**247.7**	**1.21**	**12.95**	**-67.2**	
1409	**9**	**6.68**	**0.524**	**89.1**	**0.28**	**13.10**	**-65.2**	
1412	**12**	**6.69**	**0.530**	**33.6**	**0.19**	**13.25**	**-73.9**	
1418	**18**	**6.72**	**0.535**	**10.2**	**0.14**	**13.28**	**-77.5**	
1421	**21**	**6.72**	**0.536**	**6.8**	**0.14**	**13.25**	**-75.3**	
1424	**24**	**6.72**	**0.536**	**1.2**	**0.14**	**13.26**	**-75.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW81(45)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1008**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **0950**	Purge Stop Date: **3/5/13**	Time: **1008**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **13.86** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0953	3	7.34	0.383	10.0	0.18	13.09	-152.3	
0956	6	7.36	0.386	10.0	0.16	13.04	-156.3	
0959	9	7.38	0.387	8.6	0.15	13.06	-158.6	
1002	12	7.40	0.387	4.2	0.13	13.03	-161.0	
1005	15	7.40	0.387	0.7	0.13	13.01	-161.9	
1008	18	7.41	0.387	0.0	0.12	13.02	-162.1	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-82(58)**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**
Sample ID: **ATR-MW82(58)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1308**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1250**	Purge Stop Date: **3/5/13**	Time: **1308**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.86** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1253	3	7.36	0.513	8.6	0.11	13.80	-90.1	
1256	6	7.35	0.516	2.1	0.09	13.81	-88.5	
1259	9	7.34	0.515	0.0	0.09	13.83	-85.4	
1302	12	7.34	0.515	0.0	0.09	13.84	-84.3	
1305	15	7.34	0.515	0.0	0.09	13.84	-83.6	
1308	18	7.34	0.515	0.0	0.09	13.84	-83.3	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-83(64)**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**
Sample ID: **ATR-MW83(64)-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1340**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1319**	Purge Stop Date: **3/5/13**	Time: **1340**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.30** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **21 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1322	3	7.26	0.536	17.6	0.11	13.26	-108.9	
1325	6	7.25	0.540	7.3	0.10	13.18	-95.8	
1328	9	7.24	0.537	0.8	0.10	13.13	-76.2	
1331	12	7.24	0.541	0.0	0.10	13.19	-73.3	
1334	15	7.24	0.542	0.0	0.10	13.20	-69.4	
1337	18	7.24	0.542	0.0	0.09	13.19	-68.6	
1340	21	7.23	0.542	0.0	0.09	13.19	-66.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(44)**	Location: **Top of hill East of NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW84(44)-G030413**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1604**	Sample Collection Date: **3/4/2012**	

Purge Start Date: **3/4/13**	Time: **1550**	Purge Stop Date: **3/4/13**	Time: **1604**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **41.64** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1554	4	6.88	0.764	170.0	3.35	12.78	212.4	
1556	6	6.95	0.763	45.5	3.23	13.01	212.7	
1558	8	6.97	0.765	22.6	3.20	13.06	212.3	
1600	10	6.97	0.766	12.1	3.25	13.02	212.1	
1602	12	6.98	0.767	7.6	3.17	13.02	211.6	
1604	14	6.99	0.767	3.9	3.14	13.01	211.4	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(65)**	Location: **Top of hill East of NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW84(65)-G030413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1630**	Sample Collection Date: **3/4/2012**	

Purge Start Date: **3/4/13**	Time: **1550**	Purge Stop Date: **3/4/13**	Time: **1630**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **41.52** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1555	**5**	**7.84**	**0.656**	**151.5**	**0.45**	**12.75**	**178.1**	
1600	**10**	**7.25**	**0.643**	**113.6**	**0.42**	**12.76**	**175.1**	
1605	**15**	**7.26**	**0.640**	**91.8**	**0.41**	**12.67**	**171.8**	
1610	**20**	**7.27**	**0.639**	**46.6**	**0.41**	**12.47**	**172.4**	
1615	**25**	**7.29**	**0.634**	**44.2**	**0.41**	**12.67**	**163.9**	
1620	**30**	**7.27**	**0.630**	**26.0**	**0.41**	**12.70**	**157.0**	
1625	**35**	**7.28**	**0.628**	**12.2**	**0.41**	**12.74**	**150.5**	
1630	**40**	**7.28**	**0.625**	**6.7**	**0.41**	**12.71**	**147.1**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-89(28)**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW89(28)-G030513**		Sampler: **Dwayne Gross**	
Sample Collection Time: **0940**		Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **0925**	Purge Stop Date: **3/5/13**	Time: **0940**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.96** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0928	3	6.78	0.505	19.5	0.16	13.54	-104.5	
0931	6	6.78	0.504	1.7	0.14	13.58	-110.2	
0934	9	6.78	0.506	0.0	0.13	13.64	-114.1	
0937	12	6.77	0.507	0.0	0.12	13.69	-118.3	
0940	15	6.78	0.507	0.0	0.12	13.68	-120.1	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-PM1-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1337**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1325**	Purge Stop Date: **3/6/13**	Time: **1337**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.74** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1327	2	6.94	0.679	51.9	0.26	12.26	-122.5	
1329	4	6.95	0.678	48.4	0.26	12.47	-122.8	
1331	6	6.95	0.677	48.8	0.17	12.60	-122.9	
1333	8	6.95	0.676	55.3	0.16	12.69	-122.7	
1335	10	6.95	0.675	49.2	0.15	12.70	-122.2	
1337	12	6.95	0.675	50.1	0.14	12.70	-122.2	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**	Page **1** of **1**

Sample ID: **ATR-PM2-G030613**	Sampler: **Dwayne Gross**
Sample Collection Time: **1316**	Sample Collection Date: **3/6/2013**

Purge Start Date: **3/6/13**	Time: **1255**	Purge Stop Date: **3/6/13**	Time: **1316**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.32** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **21 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1258	**3**	**6.71**	**0.760**	**118.5**	**0.15**	**12.92**	**-117.6**	
1301	**6**	**6.74**	**0.727**	**76.0**	**0.13**	**13.09**	**-118.6**	
1304	**9**	**6.76**	**0.709**	**47.4**	**0.13**	**13.15**	**-119.5**	
1307	**12**	**6.77**	**0.689**	**24.9**	**0.13**	**13.11**	**-119.7**	
1310	**15**	**6.77**	**0.684**	**13.2**	**0.13**	**13.14**	**-119.2**	
1313	**18**	**6.77**	**0.683**	**9.0**	**0.12**	**13.15**	**-118.7**	
1316	**21**	**6.78**	**0.683**	**4.8**	**0.12**	**13.15**	**-118.9**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=4.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**	Page **1** of **1**
Sample ID: **ATR-PM-3-G030513**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1036**	Sample Collection Date: **3/5/2013**	

Purge Start Date: **3/5/13**	Time: **1018**	Purge Stop Date: **3/5/13**	Time: **1036**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.63** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1021	**3**	**6.48**	**0.612**	**168.9**	**0.15**	**12.94**	**-81.6**	
1024	**6**	**6.46**	**0.610**	**58.1**	**0.13**	**13.02**	**-82.3**	
1027	**9**	**6.46**	**0.608**	**35.9**	**0.13**	**12.99**	**-82.5**	
1030	**12**	**6.45**	**0.608**	**22.1**	**0.12**	**13.05**	**-83.1**	
1033	**15**	**6.45**	**0.605**	**11.6**	**0.12**	**12.94**	**-83.5**	
1036	**18**	**6.45**	**0.608**	**5.4**	**0.11**	**12.99**	**-83.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=1.5 mg/L**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI2(16.5)-G030613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1210**	Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1200**	Purge Stop Date: **3/6/13**	Time: **1210**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.55** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1202	2	7.30	0.721	84.6	0.15	11.54	-152.0	
1204	4	7.32	0.720	41.3	0.15	11.61	-154.8	
1206	6	7.33	0.713	15.2	0.14	11.65	-156.9	
1208	8	7.34	0.711	9.7	0.15	11.62	-157.8	
1210	10	7.34	0.710	4.8	0.15	11.61	-158.5	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=5.5 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **East of pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(34.5)-G030613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1153**		Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1140**	Purge Stop Date: **3/6/13**	Time: **1153**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.41** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12.5 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1142	**2**	**7.43**	**0.477**	**3.6**	**0.17**	**12.42**	**-108.5**	
1144	**4**	**7.44**	**0.477**	**0.0**	**0.17**	**12.70**	**-107.5**	
1146	**6**	**7.45**	**0.477**	**0.0**	**0.16**	**12.79**	**-112.0**	
1148	**8**	**7.45**	**0.478**	**0.0**	**0.16**	**12.76**	**-113.7**	
1150	**10**	**7.43**	**0.480**	**0.0**	**0.15**	**12.81**	**-113.4**	
1153	**12.5**	**7.42**	**0.479**	**0.0**	**0.15**	**12.78**	**-112.3**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=0.5 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **East of pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(17.5)-G030613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1133**		Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1123**	Purge Stop Date: **3/6/13**	Time: **1133**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.42** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1125	2	7.37	0.539	47.6	0.28	11.88	-110.7	
1127	4	7.36	0.539	23.4	0.24	11.89	-113.9	
1129	6	7.35	0.539	9.8	0.22	11.92	-115.3	
1130	8	7.35	0.539	6.7	0.21	11.92	-116.1	
1133	10	7.35	0.539	4.1	0.21	11.91	-117.3	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.0 mg/L**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **East of pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI2(32.5)-G030613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1026**		Sample Collection Date: **3/6/2013**	

Purge Start Date: **3/6/13**	Time: **1011**	Purge Stop Date: **3/6/13**	Time: **1026**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **10.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1014	**3**	**7.20**	**0.491**	**23.0**	**0.14**	**12.79**	**-107.6**	
1017	**6**	**7.19**	**0.545**	**23.4**	**0.14**	**12.88**	**-109.6**	
1020	**9**	**7.19**	**0.548**	**10.1**	**0.13**	**12.89**	**109.7**	
1023	**12**	**7.18**	**0.552**	**6.8**	**0.13**	**12.90**	**109.6**	
1026	**15**	**7.18**	**0.553**	**4.3**	**0.13**	**12.91**	**109.5**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=2.5 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW-16-G040313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1231**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1213**	Purge Stop Date: **4/3/13**	Time: **1231**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1216	3	6.27	0.636	0.0	0.35	13.06	-142.0	
1219	6	6.20	1.078	0.0	0.30	13.09	-139.1	
1222	9	6.24	1.237	0.0	0.25	13.06	-138.6	
1225	12	6.17	1.285	0.0	0.22	13.16	-131.8	
1228	15	6.14	1.281	0.0	0.21	13.11	-128.1	
1231	18	6.12	1.282	0.0	0.20	13.09	-126.5	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW17-G040313**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1425**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1405**	Purge Stop Date: **4/3/13**	Time: **1425**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1410	**5**	**7.17**	**0.743**	**6.7**	**1.40**	**11.80**	**3.8**	
1415	**10**	**7.11**	**0.752**	**4.0**	**0.41**	**12.12**	**4.0**	
1420	**15**	**7.11**	**0.755**	**1.2**	**0.38**	**12.14**	**4.6**	
1425	**20**	**7.10**	**0.753**	**0.3**	**0.26**	**12.12**	**4.7**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW-26(17.5)-G040313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1259**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1241**	Purge Stop Date: **4/3/13**	Time: **1259**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.33** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1244	**3**	**6.96**	**0.537**	**1.3**	**0.18**	**12.33**	**-83.5**	
1247	**6**	**6.33**	**0.535**	**0.0**	**0.18**	**12.36**	**-47.2**	
1251	**9**	**6.01**	**0.535**	**0.0**	**0.17**	**12.36**	**-27.9**	
1254	**12**	**6.08**	**0.534**	**0.0**	**0.17**	**12.38**	**-21.3**	
1257	**15**	**6.06**	**0.534**	**0.0**	**0.17**	**12.38**	**-16.7**	
1259	**18**	**6.07**	**0.534**	**0.0**	**0.16**	**12.39**	**-12.8**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW-26(28.8)-G040313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1322**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1312**	Purge Stop Date: **4/3/13**	Time: **1322**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1314	**2**	**6.82**	**0.971**	**0.0**	**0.13**	**13.01**	**-70.6**	
1316	**4**	**6.80**	**0.954**	**0.0**	**0.13**	**13.03**	**-72.8**	
1318	**6**	**6.79**	**0.963**	**0.0**	**0.13**	**13.04**	**-74.6**	
1320	**8**	**6.78**	**0.963**	**0.0**	**0.13**	**13.05**	**-75.9**	
1322	**10**	**6.77**	**0.962**	**0.0**	**0.13**	**13.05**	**-77.2**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI-1(16.5)-G040313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1347**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1339**	Purge Stop Date: **4/3/13**	Time: **1347**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.85** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1341	**2**	**7.25**	**0.646**	**47.6**	**0.13**	**11.00**	**-147.6**	
1343	**4**	**7.30**	**0.643**	**26.0**	**0.13**	**11.04**	**-149.2**	
1345	**6**	**7.32**	**0.640**	**8.7**	**0.13**	**11.11**	**-150.5**	
1347	**8**	**7.31**	**0.640**	**4.2**	**0.13**	**11.10**	**-151.0**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI-1(34.5)-G040313**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1338**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1325**	Purge Stop Date: **4/3/13**	Time: **1338**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **13 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1328	3	7.39	0.483	0.4	0.82	12.81	-83.9	
1331	6	7.39	0.487	0.5	0.29	12.93	-108.7	
1334	9	7.38	0.490	0.4	0.28	12.95	-112.7	
1338	13	7.38	0.491	0.3	0.27	12.94	-116.4	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **East of pond at 4377**		Page **1** of **1**
Sample ID: **ATR-ZVI-2(17.5)-G040313**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1310**		Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1250**	Purge Stop Date: **4/3/13**	Time: **1310**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.39** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1255	**5**	**7.16**	**0.566**	**106.8**	**0.30**	**11.88**	**-113.5**	
1300	**10**	**7.24**	**0.563**	**17.2**	**0.28**	**11.88**	**-125.6**	
1305	**15**	**7.24**	**0.563**	**4.3**	**0.22**	**11.85**	**-129.0**	
1310	**20**	**7.28**	**0.563**	**3.4**	**0.21**	**11.85**	**-128.9**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB rlb

Monitoring Well & Vertical Aquifer Sample Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **East of pond at 4377**	Page **1** of **1**
Sample ID: **ATR-ZVI-2(32.5)-G040313**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1233**	Sample Collection Date: **4/3/13**	

Purge Start Date: **4/3/13**	Time: **1213**	Purge Stop Date: **4/3/13**	Time: **1233**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Keck Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.28** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Specific Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1218	**5**	**6.55**	**0.522**	**16.1**	**0.36**	**13.04**	**-59.5**	
1223	**10**	**6.81**	**0.550**	**2.5**	**0.26**	**13.09**	**-85.5**	
1228	**15**	**6.88**	**0.552**	**0.7**	**0.23**	**13.11**	**-92.5**	
1233	**20**	**6.90**	**0.553**	**0.4**	**0.21**	**13.11**	**-93.8**	

Comments: **NM = Not Measured, SWL = Static Water Level Fe=NM**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-1**	Location: **Off E450N, NW of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW1-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1206**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1156**	Purge Stop Date: **4/30/13**	Time: **1206**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **39.05** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1158	**2**	**6.71**	**1.007**	**40.9**	**1.07**	**13.25**	**-47.9**	
1200	**4**	**6.69**	**1.005**	**11.2**	**0.74**	**13.26**	**-63.5**	
1202	**6**	**6.67**	**1.004**	**6.3**	**0.71**	**13.26**	**-68.8**	
1204	**8**	**6.67**	**1.004**	**3.9**	**0.72**	**13.28**	**-69.3**	
1206	**10**	**6.66**	**1.004**	**4.0**	**0.73**	**13.27**	**-70.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-MW1-G043013R'.

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-3**	Location: **Directly Behind (West of) TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW3-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0918**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0906**	Purge Stop Date: **5/7/13**	Time: **0918**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **20.61** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0908	**2**	**7.22**	**0.274**	**10.8**	**0.23**	**13.19**	**-74.3**	
0910	**4**	**7.23**	**0.207**	**5.9**	**0.22**	**13.30**	**-83.6**	
0912	**6**	**7.22**	**0.191**	**3.0**	**0.22**	**13.35**	**-91.3**	
0914	**8**	**7.21**	**0.187**	**2.6**	**0.21**	**13.38**	**-93.8**	
0916	**10**	**7.23**	**0.184**	**5.3**	**0.21**	**13.38**	**-96.9**	
0918	**12**	**7.27**	**0.184**	**4.6**	**0.21**	**13.38**	**-99.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-6B**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW6B-G050313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1137**	Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **1120**	Purge Stop Date: **5/3/13**	Time: **1137**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **28.31** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1123	**5**	**7.37**	**0.419**	**10.6**	**0.28**	**15.21**	**-118.8**	
1127	**10**	**7.38**	**0.420**	**1.7**	**0.28**	**14.40**	**-127.0**	
1130	**15**	**7.39**	**0.421**	**0.0**	**0.28**	**14.26**	**-128.3**	
1133	**20**	**7.43**	**0.421**	**0.0**	**0.23**	**14.24**	**-128.6**	
1137	**25**	**7.39**	**0.421**	**0.0**	**0.23**	**14.22**	**-128.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-6C**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW6C-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0956**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0946**	Purge Stop Date: **5/7/13**	Time: **0956**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **26.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0948	**2**	**7.23**	**0.423**	**75.8**	**0.23**	**15.46**	**-66.7**	
0950	**4**	**7.22**	**0.424**	**24.5**	**0.22**	**15.52**	**-64.1**	
0952	**6**	**7.24**	**0.425**	**10.5**	**0.22**	**15.52**	**-63.0**	
0954	**8**	**7.22**	**0.425**	**1.1**	**0.22**	**15.52**	**-62.3**	
0956	**10**	**7.24**	**0.425**	**0.0**	**0.22**	**15.54**	**-62.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-MW6C-G050713R'.

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-9B**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW9B-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1555**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1540**	Purge Stop Date: **5/1/13**	Time: **1555**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **23.39** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volumed Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1543	5	7.01	0.883	10.9	0.20	13.95	0.9	
1545	10	6.93	0.885	6.2	0.19	13.94	4.0	
1548	15	6.92	0.881	1.4	0.19	13.94	5.6	
1550	20	6.93	0.876	0.0	0.19	13.98	6.5	
1553	25	6.92	0.875	0.0	0.18	13.96	7.0	
1555	30	6.92	0.874	0.0	0.18	13.96	8.1	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-9C**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW9C-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1622**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1608**	Purge Stop Date: **5/1/13**	Time: **1622**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **23.51** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volumed Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1611	**3**	**7.35**	**0.492**	**160.9**	**0.37**	**15.31**	**15.9**	
1614	**6**	**7.23**	**0.498**	**15.8**	**0.27**	**15.03**	**18.7**	
1617	**9**	**7.19**	**0.501**	**8.0**	**0.24**	**15.03**	**19.7**	
1620	**12**	**7.15**	**0.504**	**0.0**	**0.21**	**15.04**	**21.3**	
1622	**14**	**7.14**	**0.505**	**0.0**	**0.21**	**15.07**	**23.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-11**	Location: **East of TORX facility, across Old US 31 N**		Page **1** of **1**
Sample ID: **ATR-MW11-G050713**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1200**		Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **1140**	Purge Stop Date: **5/7/13**	Time: **1200**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1 Inch Diameter Disposable PVC Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **24.82** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **0.9 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallon**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1140	0.3	7.44	0.530	527.6	2.99	16.15	-19.5	
1150	0.6	7.34	0.532	939.3	2.76	14.22	-0.3	
1200	0.9	7.38	0.537	723.6	3.15	14.18	4.4	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-12**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**

Sample ID: **ATR-MW12-G050613**	Sampler: **Dwayne Gross**
Sample Collection Time: **1630**	Sample Collection Date: **5/6/2013**

Purge Start Date: **5/6/13**	Time: **1607**	Purge Stop Date: **5/6/13**	Time: **1630**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1 Inch Diameter Disposable PVC Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **23.86** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **1.5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallon**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1614	**0.5**	**7.34**	**0.457**	**301.8**	**3.01**	**15.54**	**-78.9**	
1622	**1**	**7.39**	**0.457**	**412.3**	**2.86**	**14.90**	**-74.6**	
1630	**1.5**	**7.37**	**0.458**	**433.9**	**2.91**	**14.60**	**-77.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well**

Completed by: JGS
Checked by: RLB

lub

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-13**	Location: **East of TORX facility, across Old US 31 N**		Page **1** of **1**
Sample ID: **ATR-MW13-G050613**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1623**		Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1610**	Purge Stop Date: **5/6/13**	Time: **1623**

Casing Diameter: **1 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1-inch Disposable PVC Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter

Pre-Purge SWL: **22.13** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **1 gallon**

Total Quantity of Water Discharged by Pumping: **0 gallon**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1613	0.25	7.11	0.433	370.0	2.11	15.63	-23.1	
1618	0.75	7.20	0.408	341.1	2.71	14.40	-20.2	
1623	1	7.25	0.397	344.1	3.24	13.91	-13.2	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-14**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW14-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0855**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **0840**	Purge Stop Date: **5/12/13**	Time: **0855**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.42** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0843	**3**	**7.14**	**0.408**	**2.4**	**0.34**	**13.68**	**80.6**	
0846	**6**	**7.18**	**0.413**	**1.7**	**0.28**	**13.71**	**76.2**	
0849	**9**	**7.18**	**0.416**	**1.3**	**0.25**	**13.73**	**71.1**	
0852	**12**	**7.20**	**0.418**	**1.0**	**0.23**	**13.74**	**66.5**	
0855	**15**	**7.21**	**0.419**	**1.0**	**0.22**	**13.74**	**62.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 33591226618

Well No.: **MW-15**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW15-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1103**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1046**	Purge Stop Date: **5/2/13**	Time: **1103**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1049	**5**	**7.37**	**0.365**	**14.8**	**0.19**	**13.42**	**-47.7**	
1053	**10**	**7.36**	**0.366**	**2.2**	**0.19**	**13.43**	**-46.7**	
1056	**15**	**7.35**	**0.366**	**1.8**	**0.19**	**13.43**	**-46.1**	
1059	**20**	**7.35**	**0.366**	**1.3**	**0.19**	**13.43**	**-45.1**	
1103	**25**	**7.35**	**0.366**	**1.1**	**0.19**	**13.43**	**-44.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'ATR-MW15-G050213R'.

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-16**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW16-G050213**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1129**		Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1113**	Purge Stop Date: **5/2/13**	Time: **1129**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **9.36** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1115	2	6.98	0.910	12.2	0.19	13.18	-122.4	
1117	4	6.96	0.944	1.6	0.19	13.20	-123.3	
1119	6	6.94	0.961	1.4	0.19	13.22	-124.2	
1121	8	NM	NM	NM	NM	NM	NM	
1123	10	6.92	0.944	1.5	0.18	13.25	-125.2	
1125	12	6.90	0.923	1.3	0.18	13.23	-124.8	
1127	14	6.90	0.923	1.2	0.18	13.23	-124.4	
1129	16	9.90	0.927	1.0	0.18	13.24	-124.2	

Comments: **NM = Not Measured, SWL = Static Water Level, Fe = 5.5 mg/L**

Completed by: JGS
Checked by: RLB

rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-17**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW17-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1156**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1140**	Purge Stop Date: **5/2/13**	Time: **1156**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **3.13** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1143	**4**	**7.17**	**0.553**	**36.1**	**0.21**	**12.59**	**-58.7**	
1145	**8**	**7.17**	**0.554**	**16.7**	**0.21**	**12.59**	**-50.7**	
1148	**12**	**7.16**	**0.558**	**5.6**	**0.19**	**12.66**	**-40.0**	
1151	**16**	**7.16**	**0.560**	**3.9**	**0.19**	**12.65**	**-32.8**	
1153	**20**	**7.15**	**0.532**	**4.5**	**0.19**	**12.64**	**-27.3**	
1156	**24**	**7.16**	**0.563**	**2.9**	**0.19**	**12.67**	**-22.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-19(53)**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**

Sample ID: **ATR-MW19(53)-G043013**	Sampler: **Dwayne Gross**
Sample Collection Time: **1303**	Sample Collection Date: **4/30/2013**

Purge Start Date: **4/30/13**	Time: **1245**	Purge Stop Date: **4/30/13**	Time: **1303**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.82** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1248	3	7.32	0.405	14.5	0.51	13.70	-70.2	
1251	6	7.32	0.416	5.5	0.31	13.59	-93.5	
1254	9	7.34	0.416	4.5	0.26	13.53	-101.3	
1257	12	7.38	0.418	2.4	0.21	13.53	-106.6	
1300	15	7.37	0.418	1.8	0.21	13.56	-107.9	
1303	18	7.36	0.419	1.0	0.21	13.55	-108.1	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-20(35)**	Location: **Directly In Front (East) of TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW20(35)-G050713**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1048**		Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **1028**	Purge Stop Date: **5/7/13**	Time: **1048**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1032	**2**	**7.27**	**0.455**	**5.3**	**0.29**	**15.77**	**-104.5**	
1036	**4**	**7.28**	**0.453**	**0.2**	**0.23**	**15.79**	**-105.6**	
1040	**6**	**7.28**	**0.455**	**0.0**	**0.18**	**15.82**	**-106.5**	
1044	**8**	**7.28**	**0.452**	**0.0**	**0.16**	**15.82**	**-107.1**	
1048	**10**	**7.27**	**0.451**	**0.0**	**0.15**	**15.85**	**-107.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Approved by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-20(51)**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW20(51)-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1100**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **1048**	Purge Stop Date: **5/7/13**	Time: **1100**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1050	**2**	**8.25**	**0.327**	**25.4**	**1.24**	**15.25**	**-147.5**	
1052	**4**	**7.74**	**0.337**	**8.3**	**0.52**	**15.25**	**-130.5**	
1054	**6**	**7.60**	**0.339**	**2.4**	**0.35**	**15.22**	**-129.5**	
1056	**8**	**7.55**	**0.340**	**0.0**	**0.29**	**15.25**	**-130.7**	
1058	**10**	**7.53**	**0.340**	**0.0**	**0.28**	**15.23**	**-132.0**	
1100	**12**	**7.51**	**0.340**	**0.0**	**0.26**	**15.22**	**-133.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'ATR-MW20(51)-G050713R'.

Completed by: JGS
Approved by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-20(124)**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW20(124)-G050713**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1015**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0950**	Purge Stop Date: **5/7/13**	Time: **1015**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.79** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **54 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0953	6	7.26	0.543	0.0	0.23	14.86	-130.9	
0956	12	7.29	0.540	0.0	0.16	14.58	-129.6	
0959	18	7.29	0.537	0.0	0.14	14.38	-128.7	
1002	24	7.29	0.535	0.0	0.13	14.19	-131.3	
1005	30	7.27	0.534	0.0	0.13	14.15	-130.3	
1008	36	7.29	0.532	0.0	0.12	13.99	-120.6	
1010	42	7.29	0.531	0.0	0.12	13.91	-120.1	
1012	48	7.29	0.531	0.0	0.12	13.94	-116.1	
1015	54	7.29	0.531	0.0	0.11	13.93	-112.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Approved by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-20(155)**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW20(155)-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1040**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **1007**	Purge Stop Date: **5/7/13**	Time: **1040**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **65 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1012	10	7.35	0.458	17.1	0.21	13.32	-83.3	
1017	20	7.31	0.458	7.0	0.20	12.98	-104.1	
1022	30	7.33	0.460	0.0	0.20	12.91	-108.8	
1027	40	7.33	0.462	0.0	0.20	12.90	-111.2	
1032	50	7.33	0.464	0.0	0.20	12.88	-113.1	
1037	60	7.33	0.466	0.0	0.20	12.89	-113.8	
1040	65	7.32	0.465	0.0	0.20	12.88	-114.1	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Approved by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-24(55.4)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW24(55.4)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0923**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **0905**	Purge Stop Date: **5/2/13**	Time: **0923**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **20.59** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0908	3	7.03	0.708	2.2	0.29	12.99	3.4	
0911	6	7.02	0.701	1.4	0.22	12.99	-17.2	
0914	9	7.02	0.705	1.2	0.21	13.00	-23.1	
0917	12	7.02	0.703	0.9	0.20	12.98	-30.8	
0920	15	7.03	0.703	0.9	0.20	12.99	-34.0	
0923	18	7.04	0.703	0.7	0.20	13.00	-37.0	

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'ATR-MW24(55.4)-G050213R'.

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(16.4)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW25(16.4)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1036**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1028**	Purge Stop Date: **5/2/13**	Time: **1036**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **8.03** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1029	1	7.35	0.381	58.6	0.19	11.55	-60.7	
1030	2	7.33	0.382	26.3	0.19	11.57	-58.6	
1031	3	7.33	0.383	18.0	0.19	11.61	-58.3	
1032	4	7.33	0.383	12.5	0.19	11.61	-58.1	
1033	5	7.33	0.383	9.6	0.19	11.60	-58.3	
1034	6	7.33	0.382	7.2	0.19	11.62	-58.2	
1035	7	7.33	0.383	5.5	0.18	11.62	-58.4	
1036	8	7.33	0.383	4.6	0.18	11.64	-58.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(32.6)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW25(32.6)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1020**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1005**	Purge Stop Date: **5/2/13**	Time: **1020**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **8.06** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1009	**4**	**7.44**	**0.335**	**4.8**	**0.19**	**12.84**	**-75.9**	
1011	**6**	**7.44**	**0.335**	**2.6**	**0.19**	**12.87**	**-77.2**	
1014	**9**	**7.44**	**0.335**	**1.6**	**0.19**	**12.88**	**-78.8**	
1017	**12**	**7.44**	**0.335**	**1.3**	**0.19**	**12.89**	**-79.5**	
1020	**15**	**7.44**	**0.335**	**1.0**	**0.19**	**12.88**	**-79.7**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: MW-25(82)	Location: 4377 N Old US 31, East of TORX facility	Page 1 of 1
Sample ID: ATR-MW25(82)-G050213	Sampler: Dwayne Gross	
Sample Collection Time: 0954	Sample Collection Date: 5/2/2013	

Purge Start Date: 5/2/13	Time: 0934	Purge Stop Date: 5/2/13	Time: 0954

Casing Diameter: 2 Inch	Dev Rig (Yes/No) No

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **9.77** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0938	8	7.39	0.501	10.6	0.97	13.03	-100.7	
0942	16	7.35	0.502	1.9	0.52	12.83	-102.0	
0946	24	7.34	0.502	1.6	0.36	12.77	-103.2	
0950	32	7.33	0.502	0.9	0.33	12.76	-104.3	
0954	40	7.34	0.502	0.9	0.31	12.76	-104.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(17.5)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(17.5)-G0050313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0857**	Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0843**	Purge Stop Date: **5/3/13**	Time: **0857**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.46** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0845	2	7.22	0.414	152.7	0.25	12.51	-90.3	
0847	4	7.23	0.412	102.7	0.25	12.54	-94.2	
0849	6	7.25	0.410	42.3	0.23	12.54	-99.2	
0851	8	7.27	0.408	16.8	0.22	12.52	-103.1	
0853	10	7.28	0.408	10.4	0.22	12.54	-105.8	
0855	12	7.28	0.409	7.8	0.22	12.53	-107.1	
0857	14	7.28	0.408	4.7	0.22	12.54	-108.3	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(28.8)**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW26(28.8)-G050313**		Sampler: **Dwayne Gross**	
Sample Collection Time: **0844**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0830**	Purge Stop Date: **5/3/13**	Time: **0844**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.37** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0834	**4**	**6.91**	**0.619**	**0.8**	**0.26**	**13.14**	**-68.1**	
0836	**6**	**6.94**	**0.606**	**0.1**	**0.24**	**13.15**	**-74.3**	
0838	**8**	**6.96**	**0.592**	**0.0**	**0.23**	**13.16**	**-79.3**	
0840	**10**	**6.97**	**0.585**	**0.0**	**0.23**	**13.19**	**-82.3**	
0842	**12**	**6.95**	**0.581**	**0.0**	**0.22**	**13.18**	**-83.9**	
0844	**14**	**6.98**	**0.581**	**0.0**	**0.22**	**13.19**	**-84.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(18)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW27(18)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1336**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1224**	Purge Stop Date: **5/2/13**	Time: **1336**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.46** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1327	**3**	**7.21**	**0.459**	**1.3**	**0.46**	**11.61**	**-1.9**	
1330	**6**	**7.20**	**0.458**	**0.0**	**0.31**	**11.72**	**2.8**	
1333	**9**	**7.19**	**0.457**	**0.0**	**0.23**	**11.57**	**5.0**	
1336	**12**	**7.19**	**0.457**	**0.0**	**0.21**	**11.58**	**6.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(53.05)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW27(53.05)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1318**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1250**	Purge Stop Date: **5/2/13**	Time: **1318**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **3.53** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **28 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1254	**4**	**7.32**	**0.507**	**0.0**	**0.37**	**12.44**	**-92.6**	
1258	**8**	**7.32**	**0.507**	**0.0**	**0.24**	**12.47**	**-95.0**	
1302	**12**	**7.31**	**0.506**	**0.0**	**0.21**	**12.43**	**-96.5**	
1306	**16**	**7.31**	**0.506**	**0.0**	**0.20**	**12.42**	**-97.2**	
1310	**20**	**7.31**	**0.507**	**0.0**	**0.20**	**12.50**	**-97.8**	
1314	**24**	**7.31**	**0.507**	**0.0**	**0.20**	**12.46**	**-98.3**	
1318	**28**	**7.31**	**0.507**	**0.0**	**0.20**	**12.49**	**-98.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(75.4)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW27(75.4)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1240**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1222**	Purge Stop Date: **5/2/13**	Time: **1240**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **3.43** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **36 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1225	6	7.15	0.712	0.0	0.49	12.22	-34.6	
1228	12	7.14	0.701	0.0	0.29	12.20	-36.8	
1231	18	7.13	0.695	0.0	0.22	12.26	-38.7	
1234	24	7.13	0.691	0.0	0.20	12.23	-39.5	
1237	30	7.13	0.690	0.0	0.18	12.24	-40.0	
1240	36	7.13	0.690	0.0	0.15	12.24	-40.3	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-27(104.2)**	Location: **4377 N Old US 31, East of TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW27(104.2)-G050213**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1207**		Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1140**	Purge Stop Date: **5/2/13**	Time: **1207**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **3.88** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **54 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1143	**6**	**7.39**	**0.503**	**0.0**	**0.64**	**12.38**	**-102.1**	
1146	**12**	**7.37**	**0.504**	**0.0**	**0.44**	**12.40**	**-101.0**	
1149	**18**	**7.37**	**0.505**	**0.0**	**0.34**	**12.40**	**-101.2**	
1152	**24**	**7.37**	**0.505**	**0.0**	**0.28**	**12.44**	**-101.7**	
1155	**30**	**7.36**	**0.506**	**0.0**	**0.23**	**12.48**	**-102.3**	
1158	**36**	**7.36**	**0.507**	**0.0**	**0.19**	**12.51**	**-102.6**	
1201	**42**	**7.36**	**0.505**	**0.0**	**0.18**	**12.44**	**-102.9**	
1204	**48**	**7.35**	**0.506**	**0.0**	**0.16**	**12.49**	**-103.2**	
1207	**54**	**7.35**	**0.506**	**0.0**	**0.13**	**12.51**	**-103.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-28(24.3)**	Location: **4375 N Old US 31, NE of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW28(24.3)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1600**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1550**	Purge Stop Date: **4/30/13**	Time: **1600**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1552	2	7.27	0.420	93.2	4.02	10.85	-29.5	
1554	4	7.27	0.421	50.2	4.03	10.90	-26.5	
1556	6	7.26	0.420	19.6	4.02	10.87	-21.5	
1558	8	7.26	0.420	8.7	4.02	10.83	-18.0	
1600	10	7.26	0.420	3.2	4.01	10.82	-14.9	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-28(53.2)**	Location: **4375 N Old US 31, NE of Airvac Pond**		Page **1** of **1**
Sample ID: **ATR-MW28(53.2)-G043013**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1542**		Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1525**	Purge Stop Date: **4/30/13**	Time: **1542**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **10.21** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **25 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1528	**5**	**7.43**	**0.468**	**12.1**	**2.87**	**12.05**	**-69.8**	
1532	**10**	**7.29**	**0.487**	**4.6**	**0.90**	**12.08**	**-56.6**	
1535	**15**	**7.28**	**0.488**	**2.8**	**0.81**	**12.10**	**-49.0**	
1538	**20**	**7.27**	**0.488**	**1.0**	**0.80**	**12.10**	**-45.6**	
1542	**25**	**7.26**	**0.488**	**0.7**	**0.78**	**12.03**	**-42.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: MW-28(117.7)	**Location: 4375 N Old US 31, NE of Airvac Pond**	**Page 1 of 1**
Sample ID: ATR-MW28(117.7)-G043013	**Sampler: Dwayne Gross**	
Sample Collection Time: **1516**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1448**	Purge Stop Date: **4/30/13**	Time: **1516**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **6.22** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **55 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1453	**10**	**8.01**	**0.311**	**28.7**	**0.17**	**11.65**	**-164.1**	
1458	**20**	**7.41**	**0.484**	**15.4**	**0.17**	**11.72**	**-139.9**	
1503	**30**	**7.34**	**0.498**	**4.0**	**0.17**	**11.74**	**-131.7**	
1508	**40**	**7.36**	**0.502**	**2.3**	**0.17**	**11.74**	**-127.9**	
1513	**50**	**7.35**	**0.503**	**1.6**	**0.16**	**11.75**	**-126.4**	
1516	**55**	**7.36**	**0.503**	**0.8**	**0.16**	**11.75**	**-125.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-28(138.1)**	Location: **4375 N Old US 31, NE of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW28(138.1)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1440**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1407**	Purge Stop Date: **4/30/13**	Time: **1440**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.85** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **65 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1412	**10**	**7.73**	**0.431**	**3.2**	**5.80**	**12.12**	**-55.8**	
1417	**20**	**7.62**	**0.445**	**3.4**	**1.45**	**13.02**	**-79.0**	
1422	**30**	**7.61**	**0.443**	**2.7**	**0.73**	**12.86**	**-106.5**	
1427	**40**	**7.62**	**0.444**	**0.9**	**0.49**	**12.85**	**-124.7**	
1432	**50**	**7.62**	**0.444**	**0.7**	**0.46**	**12.70**	**-130.3**	
1437	**60**	**7.61**	**0.446**	**0.7**	**0.44**	**12.79**	**-134.2**	
1440	**65**	**7.60**	**0.447**	**0.8**	**0.43**	**12.83**	**-136.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-29(82.5)**	Location: **4375 N Old US 31, NE of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW29(82.5)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1008**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **0948**	Purge Stop Date: **4/30/13**	Time: **1008**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **25.29** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0951	**5**	**7.23**	**0.430**	**4.0**	**0.37**	**11.75**	**-81.6**	
0955	**10**	**7.23**	**0.439**	**4.1**	**0.22**	**11.79**	**-94.7**	
0958	**15**	**7.22**	**0.438**	**1.6**	**0.20**	**11.77**	**-98.8**	
1001	**20**	**7.23**	**0.437**	**0.8**	**0.19**	**11.78**	**-100.9**	
1005	**25**	**7.23**	**0.437**	**0.9**	**0.19**	**11.78**	**-102.1**	
1008	**30**	**7.24**	**0.436**	**0.8**	**0.19**	**11.77**	**-103.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-29(103.3)**	Location: **4375 N Old US 31, NE of Airvac Pond**		Page **1** of **1**
Sample ID: **ATR-MW29(103.3)-G032311**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1037**		Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1017**	Purge Stop Date: **4/30/13**	Time: **1037**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1021	**8**	**7.41**	**0.378**	**2.1**	**0.90**	**11.94**	**-101.5**	
1025	**16**	**7.43**	**0.379**	**1.6**	**0.44**	**11.98**	**-119.6**	
1029	**24**	**7.45**	**0.380**	**1.0**	**0.30**	**11.96**	**-126.5**	
1033	**32**	**7.46**	**0.380**	**1.2**	**0.27**	**12.00**	**-128.3**	
1037	**40**	**7.46**	**0.379**	**1.2**	**0.25**	**11.94**	**-130.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-29(132.8)**	Location: **4375 N Old US 31, NE of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW29(132.8)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0938**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **0912**	Purge Stop Date: **4/30/13**	Time: **0938**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.36** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **52 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0915	**6**	**7.25**	**0.404**	**0.8**	**0.36**	**11.79**	**-70.7**	
0917	**10**	**7.26**	**0.405**	**0.7**	**0.26**	**11.75**	**-89.8**	
0922	**20**	**7.27**	**0.405**	**1.0**	**0.23**	**11.78**	**-93.9**	
0927	**30**	**7.28**	**0.402**	**0.8**	**0.21**	**11.79**	**-97.4**	
0932	**40**	**7.30**	**0.401**	**0.8**	**0.20**	**11.81**	**-99.1**	
0938	**52**	**7.30**	**0.401**	**0.2**	**0.20**	**11.82**	**-99.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-30(41.1)**	Location: **Airvac (4081 N Old US 31)**	Page **1** of **1**
Sample ID: **ATR-MW30(41.1)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1128**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1110**	Purge Stop Date: **5/1/13**	Time: **1128**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.91** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1113	3	7.67	0.511	0.0	5.91	12.32	-32.9	
1116	6	7.57	0.510	0.0	2.68	12.31	-113.2	
1119	9	7.49	0.508	0.0	1.80	12.30	-119.8	
1122	12	7.44	0.507	0.0	1.08	12.36	-125.7	
1125	15	7.41	0.508	0.0	0.85	12.33	-125.5	
1128	18	7.40	0.505	0.0	0.83	12.34	-125.5	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-31(30.9)**	Location: **Southeast of Airvac Pond**		Page **1** of **1**
Sample ID: **ATR-MW31(30.9)-G050113**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1032**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1020**	Purge Stop Date: **5/1/13**	Time: **1032**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **8.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1023	**3**	**7.32**	**0.490**	**51.4**	**1.10**	**11.83**	**-105.7**	
1026	**6**	**7.30**	**0.497**	**6.4**	**0.27**	**12.24**	**-127.0**	
1029	**9**	**7.30**	**0.497**	**2.3**	**0.18**	**12.31**	**-133.7**	
1032	**12**	**7.30**	**0.497**	**1.4**	**0.17**	**12.32**	**-136.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-31(55.5)**	Location: **Southeast of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW31(55.5)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1009**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0945**	Purge Stop Date: **5/1/13**	Time: **1009**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **8.91** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0949	4	7.36	0.432	5.4	5.49	13.17	-35.0	
0953	8	7.25	0.480	0.0	1.03	13.22	-77.8	
0957	12	7.24	0.485	0.0	0.59	13.26	-80.9	
1001	16	7.23	0.487	0.0	0.37	13.29	84.6	
1005	20	7.23	0.487	0.0	0.33	13.32	-85.9	
1009	24	7.23	0.488	0.0	0.31	13.32	-86.5	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-31(98.5)**	Location: **Southeast of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW31(98.5)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0936**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0915**	Purge Stop Date: **5/1/13**	Time: **0936**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.15** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **42 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0918	**6**	**7.38**	**0.512**	**0.0**	**2.14**	**13.03**	**-110.6**	
0921	**12**	**7.34**	**0.510**	**0.0**	**0.30**	**12.53**	**-120.4**	
0924	**18**	**7.34**	**0.510**	**0.0**	**0.22**	**12.49**	**-120.8**	
0927	**24**	**7.34**	**0.510**	**0.0**	**0.17**	**12.47**	**-121.1**	
0930	**30**	**7.34**	**0.510**	**0.0**	**0.14**	**12.45**	**-121.5**	
0933	**36**	**7.34**	**0.510**	**0.0**	**0.13**	**12.44**	**-122.1**	
0936	**42**	**7.34**	**0.511**	**0.0**	**0.13**	**12.44**	**123.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-31(139.2)**	Location: **Southeast of Airvac Pond**	Page **1** of **1**
Sample ID: **ATR-MW31(139.2)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0909**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0839**	Purge Stop Date: **5/1/13**	Time: **0909**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **19.83** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **60 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0842	**6**	**7.36**	**0.467**	**0.0**	**0.45**	**12.58**	**-133.4**	
0845	**12**	**7.36**	**0.467**	**0.0**	**0.32**	**12.51**	**-135.2**	
0848	**18**	**7.36**	**0.466**	**0.0**	**0.23**	**12.45**	**-135.5**	
0851	**24**	**7.36**	**0.466**	**0.0**	**0.20**	**12.45**	**-135.4**	
0854	**30**	**7.36**	**0.465**	**0.0**	**0.18**	**12.43**	**-135.9**	
0857	**36**	**7.36**	**0.465**	**0.0**	**0.19**	**12.43**	**-135.5**	
0900	**42**	**7.36**	**0.465**	**0.0**	**0.17**	**12.45**	**-135.6**	
0903	**48**	**7.37**	**0.465**	**0.0**	**0.13**	**12.43**	**-136.0**	
0906	**54**	**7.37**	**0.464**	**0.0**	**0.12**	**12.41**	**-136.3**	
0909	**60**	**7.37**	**0.464**	**0.0**	**0.11**	**12.41**	**-136.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-32(24.1)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW32(24.1)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1445**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1429**	Purge Stop Date: **4/30/13**	Time: **1445**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.79** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1433	**2**	**7.37**	**0.426**	**35.0**	**0.36**	**15.20**	**-69.3**	
1437	**4**	**7.39**	**0.415**	**4.8**	**0.42**	**15.19**	**-70.7**	
1441	**6**	**7.38**	**0.413**	**1.8**	**0.42**	**15.17**	**-69.7**	
1445	**8**	**7.38**	**0.413**	**0.5**	**0.42**	**15.18**	**-69.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-32(89)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW32(89)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1420**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1405**	Purge Stop Date: **4/30/13**	Time: **1420**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **33.21** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1408	**6**	**7.49**	**0.487**	**0.0**	**2.06**	**13.56**	**-99.1**	
1411	**12**	**7.36**	**0.491**	**0.0**	**0.51**	**13.39**	**-107.3**	
1414	**18**	**7.34**	**0.492**	**0.0**	**0.27**	**13.34**	**-106.5**	
1417	**24**	**7.32**	**0.494**	**0.0**	**0.26**	**13.32**	**-106.4**	
1420	**30**	**7.32**	**0.495**	**0.0**	**0.26**	**13.32**	**-106.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-32(110)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW32(110)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1357**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1335**	Purge Stop Date: **4/30/13**	Time: **1357**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **33.22** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1338	6	7.42	0.441	1.0	0.57	13.20	-120.6	
1341	12	7.40	0.447	7.6	0.27	13.01	-120.4	
1344	18	7.39	0.447	2.8	0.19	12.98	-121.2	
1347	24	7.38	0.448	0.3	0.15	12.96	-122.2	
1350	30	7.39	0.448	0.0	0.13	12.94	-122.9	
1353	36	7.39	0.440	0.0	0.11	12.93	-123.6	
1357	40	7.39	0.448	0.0	0.11	12.93	-123.9	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-34(37)**	Location: **In field, Southeast of Airvac**		Page **1** of **1**
Sample ID: **ATR-MW34(37)-G043013**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1618**		Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1603**	Purge Stop Date: **4/30/13**	Time: **1618**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.19** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1606	3	7.28	0.592	102.3	2.12	13.30	56.5	
1609	6	7.26	0.592	47.4	1.99	13.36	57.8	
1612	9	7.26	0.591	13.6	1.86	13.30	60.4	
1615	12	7.25	0.591	6.8	1.81	13.27	62.5	
1618	15	7.25	0.591	4.6	1.79	13.26	63.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-34(85)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW34(85)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1553**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1537**	Purge Stop Date: **4/30/13**	Time: **1553**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **32 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1540	**6**	**7.22**	**0.601**	**0.0**	**1.91**	**12.72**	**-9.6**	
1543	**12**	**7.14**	**0.605**	**0.0**	**1.11**	**12.67**	**9.0**	
1546	**18**	**7.12**	**0.606**	**0.0**	**1.02**	**12.66**	**18.8**	
1549	**24**	**7.11**	**0.606**	**0.0**	**0.99**	**12.66**	**27.5**	
1552	**30**	**7.11**	**0.607**	**0.0**	**0.99**	**12.66**	**34.5**	
1553	**32**	**7.11**	**0.607**	**0.0**	**0.99**	**12.66**	**35.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-34(110)**	Location: **In field, Southeast of Airvac**		Page **1** of **1**
Sample ID: **ATR-MW34(110)-G043013**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1529**		Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1505**	Purge Stop Date: **4/30/13**	Time: **1529**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.23** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **48 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1508	**6**	**7.29**	**0.503**	**0.0**	**3.12**	**12.93**	**17.1**	
1511	**12**	**7.22**	**0.503**	**0.0**	**1.42**	**12.87**	**-32.5**	
1514	**18**	**7.18**	**0.541**	**0.0**	**0.56**	**12.79**	**-76.3**	
1517	**24**	**7.15**	**0.559**	**0.0**	**0.27**	**12.78**	**-74.4**	
1520	**30**	**7.14**	**0.568**	**0.0**	**0.16**	**12.74**	**-75.1**	
1523	**36**	**7.14**	**0.571**	**0.0**	**0.12**	**12.75**	**-75.4**	
1526	**42**	**7.13**	**0.574**	**0.0**	**0.09**	**12.75**	**-75.8**	
1529	**48**	**7.13**	**0.575**	**0.0**	**0.08**	**12.75**	**-76.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-35(45)**	Location: **North side of field located South of E375N**	Page **1** of **1**
Sample ID: **ATR-MW35(45)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1234**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1218**	Purge Stop Date: **5/1/13**	Time: **1234**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **27.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1220	2	7.42	0.309	80.0	1.94	13.26	-60.8	
1222	4	7.38	0.328	35.3	1.17	13.31	-46.9	
1224	6	7.35	0.341	22.6	0.79	13.35	-40.7	
1226	8	7.35	0.352	11.2	0.55	13.32	-35.1	
1228	10	7.35	0.361	6.0	0.43	13.34	-30.3	
1230	12	7.33	0.366	4.2	0.40	13.33	-26.6	
1232	14	7.34	0.371	2.8	0.37	13.37	-23.8	
1234	16	7.35	0.374	1.7	0.33	13.38	-20.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-35(90)**	Location: **North side of field located South of E375N**	Page **1** of **1**
Sample ID: **ATR-MW35(90)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1304**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1240**	Purge Stop Date: **5/1/13**	Time: **1304**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.12** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **35 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1246	**5**	**7.35**	**0.475**	**0.3**	**0.18**	**12.84**	**-131.0**	
1249	**10**	**7.33**	**0.476**	**0.4**	**0.18**	**12.87**	**-130.0**	
1252	**15**	**7.34**	**0.476**	**0.0**	**0.18**	**12.85**	**-127.8**	
1255	**20**	**7.35**	**0.476**	**0.0**	**0.18**	**12.87**	**-126.4**	
1258	**25**	**7.34**	**0.476**	**0.0**	**0.18**	**12.87**	**-125.6**	
1301	**30**	**7.35**	**0.476**	**0.0**	**0.17**	**12.89**	**-124.5**	
1304	**35**	**7.34**	**0.476**	**0.0**	**0.17**	**12.89**	**-124.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-35(148)**	Location: **North side of field located South of E375N**	Page **1** of **1**
Sample ID: **ATR-MW35(148)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1210**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1140**	Purge Stop Date: **5/1/13**	Time: **1210**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **27.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **60 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1145	**10**	**7.39**	**0.437**	**11.2**	**0.20**	**13.06**	**-56.6**	
1150	**20**	**7.36**	**0.436**	**0.2**	**0.19**	**13.05**	**-40.7**	
1155	**30**	**7.35**	**0.437**	**1.1**	**0.19**	**13.03**	**-56.3**	
1200	**40**	**7.33**	**0.437**	**0.3**	**0.19**	**13.01**	**-80.8**	
1205	**50**	**7.36**	**0.437**	**0.0**	**0.18**	**12.99**	**-90.2**	
1210	**60**	**7.35**	**0.437**	**0.0**	**0.18**	**12.96**	**-93.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-36(35.2)**	Location: **East side of field located South of E375N**	Page **1** of **1**

Sample ID: **ATR-MW36(35.2)-G050113**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1549**	Sample Collection Date: **5/1/2013**

Purge Start Date: **5/1/13**	Time: **1538**	Purge Stop Date: **5/1/13**	Time: **1549**

Casing Diameter: **2 inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **16.02** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1541	3	7.22	0.571	12.5	0.38	12.87	-13.8	
1544	6	7.22	0.571	6.1	0.29	12.88	-12.2	
1547	9	7.20	0.571	3.9	0.24	12.86	-13.0	
1550	12	7.20	0.575	2.4	0.19	12.87	-15.1	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-36(92.4)**	Location: **East side of field located South of E375N**	Page **1** of **1**
Sample ID: **ATR-MW36(92.4)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1515**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1454**	Purge Stop Date: **5/1/13**	Time: **1515**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **16.01** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **42 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1457	**6**	**7.25**	**0.554**	**0.0**	**2.30**	**12.86**	**-83.5**	
1500	**12**	**7.20**	**0.565**	**0.0**	**0.83**	**12.73**	**-86.5**	
1503	**18**	**7.17**	**0.573**	**0.0**	**0.53**	**12.69**	**-85.5**	
1506	**24**	**7.15**	**0.579**	**0.0**	**0.28**	**12.73**	**-86.0**	
1509	**30**	**7.15**	**0.581**	**0.0**	**0.23**	**12.72**	**-86.5**	
1512	**36**	**7.14**	**0.582**	**0.0**	**0.21**	**12.72**	**-87.2**	
1515	**42**	**7.13**	**0.582**	**0.0**	**0.20**	**12.72**	**-87.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-36(124.5)**	Location: **East side of field located South of E375N**		Page **1** of **1**
Sample ID: **ATR-MW36(124.5)-G050113**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1447**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1420**	Purge Stop Date: **5/1/13**	Time: **1447**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **16.02** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **54 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1423	6	7.46	0.523	1.3	3.76	12.76	-1.5	
1426	12	7.49	0.517	0.0	1.52	12.72	-88.6	
1429	18	7.27	0.514	0.0	0.90	12.67	-95.7	
1432	24	7.24	0.519	0.0	0.64	12.62	-95.6	
1435	30	7.22	0.521	0.0	0.45	12.55	-96.0	
1438	36	7.22	0.522	0.0	0.38	12.52	-96.4	
1441	42	7.21	0.522	0.0	0.28	12.54	-97.3	
1444	48	7.22	0.524	0.0	0.23	12.54	-98.0	
1447	54	7.22	0.523	0.0	0.19	12.54	-98.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-37(23.3)**	Location: **3597 N Old US 31 (adjacent to residence)**	Page **1** of **1**
Sample ID: **ATR-MW37(23.3)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1400**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1336**	Purge Stop Date: **5/1/13**	Time: **1400**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **8.24** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1339	**3**	**7.23**	**0.493**	**1190.9**	**0.94**	**14.19**	**9.6**	
1342	**6**	**7.13**	**0.473**	**376.1**	**0.24**	**11.57**	**-36.7**	
1345	**9**	**7.11**	**0.475**	**92.7**	**0.17**	**11.57**	**-47.6**	
1348	**12**	**7.11**	**0.476**	**41.0**	**0.13**	**11.53**	**-53.1**	
1351	**15**	**7.11**	**0.476**	**16.1**	**0.10**	**11.52**	**-57.5**	
1354	**18**	**7.12**	**0.476**	**8.8**	**0.08**	**11.55**	**-60.5**	
1357	**21**	**7.12**	**0.476**	**6.5**	**0.08**	**11.55**	**-61.8**	
1400	**24**	**7.12**	**0.476**	**4.5**	**0.08**	**11.55**	**-62.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-37(70)**	Location: **3597 N Old US 31 (adjacent to residence)**		Page **1** of **1**
Sample ID: **ATR-MW37(70)-G050113**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1249**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1233**	Purge Stop Date: **5/1/13**	Time: **1249**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **5.11** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **32 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1236	**6**	**7.17**	**0.587**	**1.0**	**2.97**	**12.39**	**68.1**	
1239	**12**	**7.14**	**0.588**	**0.0**	**3.08**	**12.33**	**79.6**	
1242	**18**	**7.13**	**0.588**	**0.0**	**3.10**	**12.32**	**87.3**	
1245	**24**	**7.13**	**0.588**	**0.0**	**3.10**	**12.30**	**91.2**	
1248	**30**	**7.14**	**0.589**	**0.0**	**3.09**	**12.34**	**95.9**	
1249	**32**	**7.14**	**0.589**	**0.0**	**3.09**	**12.35**	**96.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-37(98)**	Location: **3597 N Old US 31 (adjacent to residence)**	Page **1** of **1**
Sample ID: **ATR-MW37(98)-G050113**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1327**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1303**	Purge Stop Date: **5/1/13**	Time: **1327**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **5.16** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **48 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1306	**6**	**7.27**	**0.495**	**4.9**	**0.77**	**12.30**	**-91.0**	
1309	**12**	**7.26**	**0.496**	**1.4**	**0.51**	**12.30**	**-91.9**	
1312	**18**	**7.26**	**0.498**	**0.0**	**0.41**	**12.31**	**-92.0**	
1315	**24**	**7.26**	**0.498**	**0.0**	**0.29**	**12.25**	**-92.5**	
1318	**30**	**7.26**	**0.499**	**0.0**	**0.26**	**12.25**	**-93.0**	
1321	**36**	**7.27**	**0.499**	**0.0**	**0.22**	**12.25**	**-93.5**	
1324	**42**	**7.27**	**0.499**	**0.0**	**0.18**	**12.23**	**-93.6**	
1327	**48**	**7.27**	**0.499**	**0.0**	**0.18**	**12.23**	**-93.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-38(20.8)**	Location: **3618 N Old US 31 (behind residence)**	Page **1** of **1**
Sample ID: **ATR-MW38(20.8)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1045**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1033**	Purge Stop Date: **5/2/13**	Time: **1045**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **5.82** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1036	**3**	**7.34**	**0.379**	**1.6**	**0.28**	**11.32**	**-143.9**	
1039	**6**	**7.34**	**0.379**	**0.4**	**0.20**	**11.32**	**-143.4**	
1042	**9**	**7.34**	**0.379**	**0.0**	**0.14**	**11.36**	**-142.4**	
1045	**12**	**7.34**	**0.379**	**0.0**	**0.13**	**11.33**	**-141.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-38(29.1)**	Location: **3618 N Old US 31 (behind residence)**	Page **1** of **1**
Sample ID: **ATR-MW38(29.1)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1024**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1004**	Purge Stop Date: **5/2/13**	Time: **1024**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **5.81** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1008	**4**	**7.34**	**0.440**	**18.5**	**0.40**	**11.72**	**-15.4**	
1012	**8**	**7.33**	**0.446**	**9.8**	**0.26**	**11.86**	**-17.2**	
1016	**12**	**7.33**	**0.452**	**2.2**	**0.18**	**11.88**	**-22.9**	
1020	**16**	**7.33**	**0.453**	**0.9**	**0.15**	**11.87**	**-27.8**	
1024	**20**	**7.33**	**0.454**	**0.6**	**0.15**	**11.87**	**-30.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-38(69.9)**	Location: **3618 N Old US 31 (behind residence)**	Page **1** of **1**

Sample ID: **ATR-MW38(69.1)-G050213**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **0953**	Sample Collection Date: **5/2/2013**

Purge Start Date: **5/2/13**	Time: **0935**	Purge Stop Date: **5/2/13**	Time: **0953**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.69** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **36 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0938	**6**	**7.31**	**0.500**	**0.0**	**1.44**	**12.08**	**-104.3**	
0941	**12**	**7.28**	**0.503**	**0.0**	**0.46**	**12.06**	**-107.6**	
0944	**18**	**7.28**	**0.504**	**0.0**	**0.32**	**12.08**	**-109.6**	
0947	**24**	**7.28**	**0.505**	**0.0**	**0.26**	**12.07**	**-110.6**	
0950	**30**	**7.28**	**0.505**	**0.0**	**0.21**	**12.09**	**-111.9**	
0953	**36**	**7.28**	**0.505**	**0.0**	**0.18**	**12.09**	**-113.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A Replicate Sample was collected along with the primary sample, 'ATR-MW38(69.9)-G050213R'.

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-38(102.5)**	Location: **3618 N Old US 31 (behind residence)**	Page **1** of **1**
Sample ID: **ATR-MW38(102.5)-G050213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0924**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **0900**	Purge Stop Date: **5/2/13**	Time: **0924**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **4.98** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **48 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0903	**6**	**7.31**	**0.440**	**0.0**	**0.33**	**12.07**	**-137.0**	
0903	**12**	**7.32**	**0.440**	**0.0**	**0.31**	**12.05**	**-136.8**	
0909	**18**	**7.33**	**0.440**	**0.0**	**0.21**	**12.04**	**-135.6**	
0912	**24**	**7.34**	**0.440**	**0.0**	**0.20**	**12.06**	**-135.6**	
0915	**30**	**7.34**	**0.440**	**0.0**	**0.18**	**12.04**	**-135.1**	
0918	**36**	**7.34**	**0.440**	**0.0**	**0.16**	**12.05**	**-135.0**	
0921	**42**	**7.35**	**0.440**	**0.0**	**0.15**	**12.05**	**-134.9**	
0924	**48**	**7.35**	**0.440**	**0.0**	**0.14**	**12.05**	**-135.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-39(13)**	Location: **3597 N Old US 31 (near highway)**		Page **1** of **1**
Sample ID: **ATR-MW39(13)-G050113**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1516**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1456**	Purge Stop Date: **5/1/13**	Time: **1516**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **3.10** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1500	**4**	**7.13**	**0.671**	**282.4**	**0.35**	**12.27**	**-31.7**	
1502	**6**	**7.12**	**0.665**	**108.2**	**0.30**	**12.08**	**-25.7**	
1504	**8**	**7.11**	**0.665**	**69.8**	**0.29**	**12.12**	**-18.5**	
1506	**10**	**7.11**	**0.668**	**47.3**	**0.29**	**12.28**	**-15.6**	
1508	**12**	**7.11**	**0.664**	**23.7**	**0.27**	**12.05**	**-12.8**	
1510	**14**	**7.11**	**0.664**	**14.3**	**0.27**	**12.11**	**-10.0**	
1512	**16**	**7.10**	**0.664**	**10.0**	**0.26**	**12.05**	**-6.9**	
1514	**18**	**7.11**	**0.664**	**5.8**	**0.25**	**12.09**	**-4.5**	
1516	**20**	**7.11**	**0.664**	**3.2**	**0.24**	**12.04**	**-1.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-39(29.3)**	Location: **3597 N Old US 31 (near highway)**	Page **1** of **1**
Sample ID: **ATR-MW39(29.3)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1450**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1440**	Purge Stop Date: **5/1/13**	Time: **1450**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **2.69** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1442	**3**	**7.27**	**0.543**	**7.3**	**0.18**	**12.47**	**-81.2**	
1444	**6**	**7.27**	**0.543**	**2.7**	**0.18**	**12.53**	**-81.3**	
1446	**9**	**7.27**	**0.542**	**0.6**	**0.18**	**12.49**	**-81.9**	
1448	**12**	**7.28**	**0.542**	**0.0**	**0.18**	**12.57**	**-82.9**	
1450	**15**	**7.27**	**0.541**	**0.0**	**0.18**	**12.53**	**-83.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
rlb

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-39(76.8)**	Location: **3597 N Old US 31 (near highway)**		Page **1** of **1**
Sample ID: **ATR-MW39(76.8)-G050113**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1433**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1413**	Purge Stop Date: **5/1/13**	Time: **1433**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **1.85** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **40 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1417	8	7.31	0.552	0.0	0.69	12.41	-90.6	
1421	16	7.27	0.557	0.0	0.38	12.28	-89.5	
1425	24	7.26	0.557	0.0	0.30	12.27	-89.7	
1429	32	7.25	0.557	0.0	0.28	12.26	-90.1	
1433	40	7.24	0.557	0.0	0.26	12.25	-90.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-45(185)**	Location: **Directly In Front (East) of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW45(185)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1354**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1314**	Purge Stop Date: **4/30/13**	Time: **1354**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **28.21** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **80 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1319	10	7.30	0.423	0.8	0.23	13.96	-78.0	
1324	20	7.28	0.415	0.6	0.19	13.37	-102.1	
1329	30	7.31	0.414	0.6	0.18	13.29	-104.7	
1334	40	7.27	0.412	0.6	0.18	13.23	-102.8	
1339	50	7.27	0.412	0.6	0.18	13.20	-102.8	
1344	60	7.26	0.411	0.6	0.18	13.17	-101.8	
1349	70	7.25	0.411	0.6	0.18	13.18	-101.0	
1354	80	7.26	0.411	0.6	0.18	13.19	-100.8	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-48(159)**	Location: **4375 North Old Hwy 31**	Page **1** of **1**
Sample ID: **ATR-MW48(159)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1122**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1047**	Purge Stop Date: **4/30/13**	Time: **1122**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **26.20** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **70 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1052	10	7.53	0.464	1.1	0.20	12.25	-176.7	
1057	20	7.47	0.466	1.1	0.19	12.24	-171.9	
1102	30	7.47	0.466	0.7	0.18	12.26	-169.4	
1107	40	7.46	0.468	0.5	0.18	12.26	-168.1	
1112	50	7.46	0.468	0.6	0.17	12.29	-168.3	
1117	60	7.46	0.469	0.3	0.18	12.27	-167.8	
1122	70	7.46	0.469	0.2	0.18	12.28	-167.0	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-MW48(159)-G043013R'.

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-50(45)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW50(45)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1040**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1020**	Purge Stop Date: **4/30/13**	Time: **1040**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **6.31** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1024	4	7.41	0.415	1.8	0.16	12.65	-40.0	
1028	8	7.40	0.419	0.6	0.10	12.79	-75.0	
1032	12	7.41	0.421	0.1	0.08	12.83	-97.1	
1036	16	7.42	0.421	0.0	0.07	12.83	-103.2	
1040	20	7.42	0.421	0.0	0.07	12.83	-108.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-50(80)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW50(80)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1014**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **0956**	Purge Stop Date: **4/30/13**	Time: **1014**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **7.31** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **36 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0959	**6**	**7.36**	**0.429**	**10.6**	**1.02**	**12.82**	**1.1**	
1002	**12**	**7.34**	**0.431**	**28.0**	**0.58**	**12.89**	**1.8**	
1005	**18**	**7.33**	**0.442**	**2.4**	**0.22**	**12.76**	**-43.4**	
1008	**24**	**7.33**	**0.444**	**0.1**	**0.15**	**12.76**	**-61.2**	
1011	**30**	**7.32**	**0.446**	**0.0**	**0.14**	**12.76**	**-65.1**	
1014	**36**	**7.32**	**0.447**	**0.0**	**0.14**	**12.76**	**-67.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-50(130)**	Location: **In field, Southeast of Airvac**	Page **1** of **1**
Sample ID: **ATR-MW50(130)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0951**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **0924**	Purge Stop Date: **4/30/13**	Time: **0951**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **9.13** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **54 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0927	6	7.34	0.431	1.2	3.32	12.85	-73.5	
0930	12	7.35	0.430	0.0	0.90	12.70	-106.5	
0933	18	7.35	0.444	0.0	0.39	12.60	-116.5	
0936	24	7.35	0.456	0.0	0.27	12.54	-120.8	
0939	30	7.34	0.460	0.0	0.23	12.56	-123.6	
0942	36	7.34	0.461	0.0	0.19	12.57	-127.2	
0945	42	7.34	0.463	0.0	0.16	12.58	-129.3	
0948	48	7.35	0.463	0.0	0.15	12.57	-130.9	
0951	54	7.35	0.464	0.0	0.15	12.58	-131.2	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-51(25)**	Location: **In field, Southeast of Airvac near pond**		Page **1** of **1**
Sample ID: **ATR-MW51(25)-G043013**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1217**		Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1205**	Purge Stop Date: **4/30/13**	Time: **1217**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **2.14** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1208	**3**	**7.39**	**0.427**	**2.3**	**0.08**	**10.96**	**-118.3**	
1211	**6**	**7.28**	**0.428**	**0.0**	**0.04**	**11.03**	**-119.0**	
1214	**9**	**7.26**	**0.428**	**0.0**	**0.03**	**11.04**	**-120.0**	
1217	**12**	**7.27**	**0.428**	**0.0**	**0.03**	**11.04**	**-120.7**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-51(70)**	Location: **In field, Southeast of Airvac near pond**	Page **1** of **1**
Sample ID: **ATR-MW51(70)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1200**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1142**	Purge Stop Date: **4/30/13**	Time: **1200**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **2.18** Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **36 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1145	**6**	**7.34**	**0.440**	**0.4**	**1.68**	**12.40**	**-70.9**	
1148	**12**	**7.31**	**0.442**	**0.7**	**0.76**	**12.36**	**-90.7**	
1151	**18**	**7.33**	**0.442**	**0.0**	**0.28**	**12.32**	**-101.6**	
1154	**24**	**7.33**	**0.445**	**0.0**	**0.21**	**12.35**	**-104.6**	
1157	**30**	**7.33**	**0.446**	**0.0**	**0.20**	**12.35**	**-105.1**	
1200	**36**	**7.33**	**0.446**	**0.0**	**0.19**	**12.35**	**-105.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-51(117)**	Location: **In field, Southeast of Airvac near pond**	Page **1** of **1**
Sample ID: **ATR-MW51(117)-G043013**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1134**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1106**	Purge Stop Date: **4/30/13**	Time: **1134**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **2.81** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **56 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1110	**8**	**7.44**	**0.401**	**0.0**	**1.09**	**12.34**	**-95.1**	
1114	**16**	**7.43**	**0.402**	**0.0**	**0.44**	**12.20**	**-117.9**	
1118	**24**	**7.42**	**0.403**	**0.0**	**0.24**	**12.13**	**-123.1**	
1122	**32**	**7.42**	**0.403**	**0.0**	**0.18**	**12.13**	**-125.0**	
1126	**40**	**7.43**	**0.403**	**0.0**	**0.17**	**12.14**	**-127.7**	
1130	**48**	**7.42**	**0.404**	**0.0**	**0.16**	**12.13**	**-128.6**	
1134	**56**	**7.42**	**0.404**	**0.0**	**0.15**	**12.13**	**-129.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-52(55)**	Location: **Directly behind of TORX facility, access rd.**	Page **1** of **1**
Sample ID: **ATR-MW52(55)-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0855**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0839**	Purge Stop Date: **5/7/13**	Time: **0855**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.68** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0842	**4**	**7.31**	**0.611**	**12.8**	**0.73**	**13.66**	**-83.8**	
0844	**8**	**7.28**	**0.609**	**0.0**	**0.48**	**13.62**	**-93.4**	
0847	**12**	**7.27**	**0.607**	**0.0**	**0.40**	**13.67**	**-96.5**	
0850	**16**	**7.28**	**0.604**	**0.0**	**0.37**	**13.65**	**-98.8**	
0852	**20**	**7.27**	**0.601**	**0.0**	**0.34**	**13.65**	**-100.8**	
0855	**24**	**7.27**	**0.601**	**0.0**	**0.32**	**13.67**	**-101.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-53(41)**	Location: **Behind of TORX facility, access road**	Page **1** of **1**
Sample ID: **ATR-MW53(41)-G043013**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1235**	Sample Collection Date: **4/30/2013**	

Purge Start Date: **4/30/13**	Time: **1225**	Purge Stop Date: **4/30/13**	Time: **1235**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **24.94** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1227	**2**	**7.03**	**0.511**	**63.4**	**0.19**	**11.50**	**-62.2**	
1229	**4**	**7.04**	**0.515**	**12.7**	**0.18**	**11.60**	**-43.6**	
1231	**6**	**7.03**	**0.515**	**8.1**	**0.18**	**11.61**	**-38.2**	
1233	**8**	**7.03**	**0.515**	**4.9**	**0.18**	**11.63**	**-33.7**	
1235	**10**	**7.04**	**0.515**	**3.8**	**0.18**	**11.63**	**-30.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-55(49)**	Location: **Directly behind TORX facility along access rd.**		Page **1** of **1**
Sample ID: **ATR-MW55(49)-G050713**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0824**		Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0806**	Purge Stop Date: **5/7/13**	Time: **0824**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.87** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0809	**3**	**7.31**	**0.390**	**0.0**	**1.54**	**13.63**	**-85.3**	
0812	**6**	**7.33**	**0.392**	**0.0**	**0.81**	**13.64**	**-93.0**	
0815	**9**	**7.35**	**0.391**	**0.0**	**0.46**	**13.65**	**-100.5**	
0818	**12**	**7.37**	**0.392**	**0.0**	**0.36**	**13.68**	**-104.8**	
0821	**15**	**7.37**	**0.392**	**0.0**	**0.35**	**13.68**	**-107.1**	
0824	**18**	**7.37**	**0.392**	**0.0**	**0.34**	**13.68**	**-108.7**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-56(51)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW56(51)-G050713**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0822**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0806**	Purge Stop Date: **5/7/13**	Time: **0822**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **11.14** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0809	**4**	**7.35**	**0.346**	**15.3**	**1.75**	**13.36**	**-11.8**	
0811	**8**	**7.36**	**0.349**	**6.8**	**1.09**	**13.38**	**-57.3**	
0814	**12**	**7.38**	**0.351**	**0.3**	**0.77**	**13.40**	**-87.2**	
0817	**16**	**7.39**	**0.351**	**0.0**	**0.51**	**13.40**	**-103.3**	
0819	**20**	**7.40**	**0.352**	**0.0**	**0.49**	**13.40**	**-109.3**	
0822	**24**	**7.41**	**0.351**	**0.0**	**0.48**	**13.40**	**-113.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-57(38)**	Location: **Directly behind TORX facility west of pond**	Page **1** of **1**
Sample ID: **ATR-MW57(38)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1231**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1215**	Purge Stop Date: **5/2/13**	Time: **1231**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **7.91** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1219	**4**	**7.29**	**0.441**	**8.4**	**0.18**	**11.67**	**-13.7**	
1223	**8**	**7.29**	**0.440**	**2.7**	**0.18**	**11.66**	**-9.9**	
1227	**12**	**7.30**	**0.439**	**1.9**	**0.18**	**11.67**	**-7.4**	
1231	**16**	**7.29**	**0.439**	**1.4**	**0.18**	**11.69**	**-5.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(29)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **ATR-MW59(29)-G050313**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1056**	Sample Collection Date: **5/3/2013**

Purge Start Date: **5/3/13**	Time: **1040**	Purge Stop Date: **5/3/13**	Time: **1056**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.68** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1044	**2**	**6.60**	**0.478**	**10.6**	**0.21**	**13.98**	**-104.1**	
1048	**4**	**6.61**	**0.475**	**9.8**	**0.17**	**14.06**	**-110.1**	
1052	**6**	**6.61**	**0.476**	**9.1**	**0.17**	**14.08**	**-104.1**	
1056	**8**	**6.61**	**0.476**	**9.0**	**0.17**	**14.09**	**-105.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-59(46)**	Location: **Behind TORX facility along access road**	Page **1** of **1**

Sample ID: **ATR-MW59(46)-G050213**	Sampler: **Dwayne Gross**
Sample Collection Time: **1337**	Sample Collection Date: **5/2/2013**

Purge Start Date: **5/2/13**	Time: **1321**	Purge Stop Date: **5/2/13**	Time: **1337**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.23** (feet below top of casing) Max Drawdown during pumping: **NM** ft. @ **NM** GPM

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1325	4	7.48	0.285	13.5	0.20	14.04	-137.7	
1329	8	7.54	0.286	3.4	0.19	14.01	-151.5	
1333	12	7.55	0.287	4.1	0.19	14.11	-155.5	
1337	16	7.55	0.286	3.3	0.19	14.07	-157.5	

Comments: **NM = Not Measured, SWL = Static Water Level, Fe = ~2.0 mg/L**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-60(38)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW60(38)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1312**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1257**	Purge Stop Date: **5/2/13**	Time: **1312**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **13.29** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1301	**4**	**7.62**	**0.260**	**5.3**	**0.20**	**13.86**	**-151.7**	
1303	**6**	**7.63**	**0.265**	**4.5**	**0.20**	**13.91**	**-154.8**	
1306	**9**	**7.64**	**0.271**	**3.5**	**0.20**	**13.95**	**-157.6**	
1309	**12**	**7.66**	**0.271**	**3.1**	**0.19**	**13.96**	**-159.3**	
1312	**15**	**7.65**	**0.271**	**3.0**	**0.19**	**13.98**	**-160.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-61(26)**	Location: **Directly behind TORX facility along access rd.**		Page **1** of **1**
Sample ID: **ATR-MW61(26)-G050713**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0934**		Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0910**	Purge Stop Date: **5/7/13**	Time: **0934**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **17.39** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0914	**2**	**6.84**	**0.339**	**21.4**	**0.46**	**13.29**	**-72.6**	
0918	**4**	**6.84**	**0.347**	**20.3**	**0.28**	**14.24**	**-74.3**	
0922	**6**	**6.85**	**0.325**	**37.3**	**0.19**	**12.91**	**-87.1**	
0926	**8**	**6.86**	**0.316**	**14.6**	**0.15**	**12.66**	**-84.6**	
0930	**10**	**6.86**	**0.315**	**4.1**	**0.16**	**12.60**	**-87.8**	
0934	**12**	**6.86**	**0.314**	**3.2**	**0.16**	**12.58**	**-90.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-MW61(26)-G050713R'.

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-62(36)**	Location: **Directly in front of TORX facility in grass**	Page **1** of **1**
Sample ID: **ATR-MW62(36)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1449**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1425**	Purge Stop Date: **5/2/13**	Time: **1449**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **26.02** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **24 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1427	2	7.31	0.431	441.3	0.21	15.60	-104.0	
1429	4	7.26	0.434	325.7	0.21	15.56	-101.0	
1431	6	7.27	0.435	238.5	0.21	15.52	-98.9	
1433	8	7.26	0.438	133.0	0.20	15.48	-95.1	
1435	10	7.25	0.441	70.5	0.20	15.56	-92.5	
1437	12	7.22	0.442	38.0	0.20	15.48	-88.8	
1439	14	7.23	0.443	19.0	0.20	15.49	-87.0	
1441	16	7.24	0.444	19.6	0.20	15.50	-86.1	
1443	18	7.22	0.445	12.9	0.20	15.51	-84.5	
1445	20	7.22	0.446	8.3	0.19	15.52	-83.1	
1447	22	7.24	0.448	8.2	0.20	15.61	-82.1	
1449	24	7.23	0.449	4.7	0.20	15.64	-81.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-65(32)**	Location: **Inside the TORX facility**	Page **1** of **1**

Sample ID: **ATR-MW65(32)-G050613**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1422**	Sample Collection Date: **5/6/2013**

Purge Start Date: **5/6/13**	Time: **1400**	Purge Stop Date: **5/6/13**	Time: **1422**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter

Pre-Purge SWL: **24.70** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2.25 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1406	**0.75**	**7.39**	**0.320**	**1252.0**	**2.58**	**16.98**	**-108.8**	
1414	**1.5**	**7.46**	**0.307**	**1232.2**	**2.97**	**16.92**	**-103.5**	
1422	**2.25**	**7.43**	**0.299**	**1252.8**	**3.23**	**16.95**	**-100.6**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 33591222618

Well No.: **MW-67(30)**	Location: **Inside Torx Facility**		Page **1** of **1**
Sample ID: **ATR-MW67(30)-G050613**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1502**		Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1432**	Purge Stop Date: **5/6/13**	Time: **1502**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **24.75** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **3 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1442	**1**	**7.02**	**0.617**	**1236.5**	**2.84**	**17.44**	**15.7**	
1452	**2**	**7.03**	**0.630**	**1255.1**	**3.64**	**17.29**	**51.9**	
1502	**3**	**7.03**	**0.633**	**1241.6**	**4.01**	**NM**	**78.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-68(32)**	Location: **Inside Torx Facility**	Page **1** of **1**
Sample ID: **ATR-MW68(32)-G050613**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1350**	Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1324**	Purge Stop Date: **5/6/13**	Time: **1350**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **24.67** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2.25 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1330	**0.75**	**6.84**	**0.648**	**1234.6**	**2.02**	**17.25**	**-44.5**	
1340	**1.5**	**6.91**	**0.647**	**1234.6**	**2.89**	**17.16**	**-17.8**	
1350	**2.25**	**6.86**	**0.649**	**1226.5**	**2.95**	**17.08**	**-6.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of baling water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-71(33)**	Location: **Inside Torx Facility**	Page **1** of **1**

Sample ID: **ATR-MW71(33)-G050613**	Sampler: **Gregg Schoenberger**
Sample Collection Time: **1539**	Sample Collection Date: **5/6/2013**

Purge Start Date: **5/6/13**	Time: **1511**	Purge Stop Date: **5/6/13**	Time: **1539**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **24.35** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2.5 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1519	**0.75**	**6.97**	**0.568**	**1232**	**2.29**	**17.24**	**-82.7**	
1529	**1.5**	**6.78**	**0.571**	**1234**	**3.14**	**17.86**	**-106.4**	
1539	**2.5**	**6.75**	**0.573**	**1236**	**3.08**	**17.89**	**-107.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-72(32)**	Location: **Inside the Torx Facility**	Page **1** of **1**
Sample ID: **ATR-MW72(32)-G050613**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1315**	Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1230**	Purge Stop Date: **5/6/13**	Time: **1315**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **Disposable Bailer, Water Level Indicator,**
YSI 6920 Water Quality Meter

Pre-Purge SWL: **24.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2.25 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1245	**0.75**	**6.96**	**0.587**	**782.2**	**2.50**	**17.30**	**-108.7**	
1300	**1.5**	**6.98**	**0.584**	**876.3**	**3.18**	**16.97**	**-100.6**	
1315	**2.25**	**6.99**	**0.570**	**721.0**	**3.04**	**16.95**	**-93.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-75(32)**	Location: **Inside Torx Facility**	Page **1** of **1**
Sample ID: **ATR-MW75(32)-G050613**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1220**	Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1154**	Purge Stop Date: **5/6/13**	Time: **1220**

Casing Diameter: **1.5 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Bailing; purge minimum 3 casing volumes.**

Equipment: **1" Disposable Bailer, Water Level Indicator, YSI 6920 Water Quality Meter**

Pre-Purge SWL: **24.73** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **NM**

Total Quantity of Water Bailed: **2 gallons**

Total Quantity of Water Discharged by Pumping: **0 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1201	0.5	7.31	0.517	107.7	3.43	18.49	184.3	
1207	1	7.26	0.514	227.3	4.21	17.45	108.1	
1214	1.5	7.36	0.511	317.9	5.01	17.89	109.1	
1220	2	7.32	0.510	387.6	4.89	17.64	112.1	

Comments: **NM = Not Measured, SWL = Static Water Level**
***DO is elevated due to affects of bailing water from the well.**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-76(30)**	Location: **Inside Torx Facility**	Page **1** of **1**

Sample ID: **ATR-MW76(30)-G050613**	Sampler: **Dwayne Gross**
Sample Collection Time: **1412**	Sample Collection Date: **5/6/2013**

Purge Start Date: **5/6/13**	Time: **1400**	Purge Stop Date: **5/6/13**	Time: **1412**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **24.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1402	2	6.75	0.674	52.7	0.22	16.55	-28.9	
1404	4	6.73	0.674	20.3	0.22	16.60	-21.2	
1406	6	6.72	0.676	12.5	0.21	16.61	-16.2	
1408	8	6.71	0.677	6.3	0.21	16.62	-9.3	
1410	10	6.70	0.677	4.6	0.21	16.62	-5.5	
1412	12	6.70	0.678	3.2	0.21	16.62	-2.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-77(41)**	Location: **Inside Torx Facility**	Page **1** of **1**
Sample ID: **ATR-MW77(41)-G050613**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1306**	Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1250**	Purge Stop Date: **5/6/13**	Time: **1306**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **24.69** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1254	2	7.45	0.277	38.9	0.25	16.29	-141.9	
1256	3	7.46	0.285	33.7	0.24	16.15	-141.0	
1258	4	7.45	0.286	27.4	0.24	16.11	-139.9	
1300	5	7.42	0.285	24.1	0.24	16.07	-137.9	
1302	6	7.44	0.285	24.0	0.24	16.10	-139.2	
1304	7	7.45	0.285	23.6	0.23	16.08	-140.1	
1306	8	7.46	0.285	22.5	0.23	16.07	-140.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-78(35)**	Location: **Inside Torx Facility**	Page **1** of **1**

Sample ID: **ATR-MW78(35)-G050613**	Sampler: **Dwayne Gross**
Sample Collection Time: **1344**	Sample Collection Date: **5/6/2013**

Purge Start Date: **5/6/13**	Time: **1324**	Purge Stop Date: **5/6/13**	Time: **1344**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **24.64** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1326	**2**	**NM**	**NM**	**NM**	**NM**	**NM**	**NM**	
1328	**4**	**7.24**	**0.350**	**121.2**	**0.22**	**15.80**	**-82.6**	
1330	**6**	**7.22**	**0.350**	**86.5**	**0.21**	**15.80**	**-79.3**	
1332	**8**	**7.25**	**0.351**	**37.8**	**0.21**	**15.79**	**-79.3**	
1334	**10**	**7.25**	**0.350**	**28.7**	**0.21**	**15.80**	**-78.5**	
1336	**12**	**7.26**	**0.350**	**23.7**	**0.21**	**15.78**	**-77.9**	
1338	**14**	**7.26**	**0.351**	**18.7**	**0.21**	**15.79**	**-77.7**	
1340	**16**	**7.26**	**0.350**	**12.6**	**0.21**	**15.78**	**-77.1**	
1342	**18**	**7.27**	**0.350**	**8.0**	**0.21**	**15.79**	**-76.9**	
1344	**20**	**7.27**	**0.351**	**4.7**	**0.21**	**15.78**	**-76.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-79(30)**	Location: **Inside Torx Facility**		Page **1** of **1**
Sample ID: **ATR-MW79(30)-G050613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1235**		Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1203**	Purge Stop Date: **5/6/13**	Time: **1235**

Casing Diameter: **2.0 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **25.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **16 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO* (mg/L)	Temp (°C)	ORP (mV)	Remarks
1205	**1**	**7.14**	**0.364**	**744.3**	**0.31**	**16.57**	**-122.4**	
1207	**2**	**7.13**	**0.357**	**620.3**	**0.31**	**16.56**	**-125.8**	
1209	**3**	**7.11**	**0.346**	**305.4**	**0.28**	**16.48**	**-129.7**	
1211	**4**	**7.15**	**0.340**	**203.2**	**0.27**	**16.46**	**-132.8**	
1213	**5**	**7.17**	**0.337**	**137.3**	**0.26**	**16.44**	**-138.5**	
1215	**6**	**7.19**	**0.333**	**99.0**	**0.25**	**16.44**	**-137.3**	
1217	**7**	**7.20**	**0.329**	**84.5**	**0.25**	**16.42**	**-139.0**	
1219	**8**	**7.21**	**0.329**	**56.4**	**0.24**	**16.40**	**-139.8**	
1221	**9**	**7.21**	**0.324**	**43.7**	**0.24**	**16.42**	**-140.8**	
1223	**10**	**7.23**	**0.324**	**39.0**	**0.24**	**16.40**	**-141.6**	
1225	**11**	**7.23**	**0.322**	**31.7**	**0.24**	**16.39**	**-142.2**	
1227	**12**	**7.24**	**0.320**	**28.3**	**0.23**	**16.40**	**-142.8**	
1229	**13**	**7.24**	**0.319**	**26.8**	**0.23**	**16.39**	**-143.3**	
1231	**14**	**7.25**	**0.318**	**26.0**	**0.23**	**16.38**	**-143.7**	
1233	**15**	**7.25**	**0.318**	**25.1**	**0.23**	**16.41**	**-143.9**	
1235	**16**	**7.25**	**0.317**	**24.7**	**0.23**	**16.42**	**-144.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-80(19)**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW80(19)-G050213**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1444**		Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1408**	Purge Stop Date: **5/2/13**	Time: **1444**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **6.81** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1412	**2**	**7.45**	**0.313**	**1173.4**	**1.02**	**13.48**	**-126.8**	
1416	**4**	**7.52**	**0.339**	**1181.4**	**0.20**	**14.47**	**-153.4**	
1420	**6**	**7.50**	**0.335**	**1175.4**	**0.16**	**13.78**	**-156.5**	
1424	**8**	**7.49**	**0.358**	**1193.4**	**0.15**	**16.00**	**-160.9**	
1428	**10**	**7.48**	**0.343**	**1182.4**	**0.13**	**14.51**	**-161.1**	
1432	**12**	**7.44**	**0.336**	**1174.0**	**0.11**	**13.75**	**-161.3**	
1436	**14**	**7.43**	**0.334**	**1126.6**	**0.11**	**13.99**	**-162.5**	
1440	**16**	**7.42**	**0.331**	**1106.3**	**0.10**	**13.75**	**-162.5**	
1444	**18**	**7.42**	**0.330**	**964.5**	**0.10**	**13.75**	**-162.9**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(27)**	Location: **Behind TORX facility along access road**		Page **1** of **1**
Sample ID: **ATR-MW81(27)-G050313**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1124**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **1108**	Purge Stop Date: **5/3/13**	Time: **1124**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **12.99** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1112	**2**	**6.76**	**0.416**	**27.6**	**NM**	**13.61**	**-74.8**	
1116	**4**	**6.77**	**0.418**	**16.7**	**NM**	**13.70**	**-76.9**	
1120	**6**	**6.78**	**0.419**	**8.7**	**NM**	**13.69**	**-79.7**	
1124	**8**	**6.78**	**0.419**	**4.8**	**NM**	**13.64**	**-81.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-81(45)**	Location: **Behind TORX facility along access road**	Page **1** of **1**
Sample ID: **ATR-MW81(45)-G050213**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1408**	Sample Collection Date: **5/2/2013**	

Purge Start Date: **5/2/13**	Time: **1350**	Purge Stop Date: **5/2/13**	Time: **1408**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.72** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1353	**3**	**7.49**	**0.302**	**14.8**	**0.19**	**13.88**	**-144.1**	
1356	**6**	**7.52**	**0.302**	**9.2**	**0.19**	**13.88**	**-146.3**	
1359	**9**	**7.52**	**0.302**	**4.9**	**0.19**	**13.88**	**-148.6**	
1402	**12**	**7.53**	**0.301**	**3.5**	**0.19**	**13.88**	**-150.0**	
1405	**15**	**7.54**	**0.301**	**3.3**	**0.19**	**13.87**	**-151.6**	
1408	**18**	**7.53**	**0.301**	**3.0**	**0.19**	**13.88**	**-152.3**	

Comments: **NM = Not Measured, SWL = Static Water Level, Fe = 2.0 mg/L**

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-82(58)**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**

Sample ID: **ATR-MW82(58)-G050713**	Sampler: **Dwayne Gross**
Sample Collection Time: **1130**	Sample Collection Date: **5/7/2013**

Purge Start Date: **5/7/13**	Time: **1112**	Purge Stop Date: **5/7/13**	Time: **1130**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **22.79** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1115	**3**	**7.44**	**0.409**	**25.3**	**0.23**	**14.92**	**-92.3**	
1118	**6**	**7.43**	**0.409**	**16.3**	**0.22**	**14.85**	**-88.4**	
1121	**9**	**7.41**	**0.410**	**5.8**	**0.22**	**14.85**	**-84.9**	
1124	**12**	**7.41**	**0.410**	**0.3**	**0.21**	**14.90**	**-80.7**	
1127	**15**	**7.41**	**0.410**	**0.0**	**0.21**	**14.91**	**-79.8**	
1130	**18**	**7.40**	**0.411**	**0.0**	**0.21**	**14.93**	**-79.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-83(64)**	Location: **East of TORX facility, across Old US 31 N**	Page **1** of **1**
Sample ID: **ATR-MW83(64)-G050713**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1135**	Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **1115**	Purge Stop Date: **5/7/13**	Time: **1135**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **23.12** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1119	4	7.36	0.426	4.2	0.28	14.47	-75.2	
1123	8	7.34	0.427	5.2	0.19	14.50	-66.9	
1127	12	7.33	0.428	0.0	0.18	14.52	-60.1	
1131	16	7.33	0.428	0.0	0.17	14.53	-55.7	
1135	20	7.35	0.427	0.0	0.16	14.58	-52.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(44)**	Location: **Top of hill East of NOUSHWY31**		Page **1** of **1**
Sample ID: **ATR-MW84(44)-G050113**		Sampler: **Dwayne Gross**	
Sample Collection Time: **0924**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0900**	Purge Stop Date: **5/1/13**	Time: **0924**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **40.61** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0903	1.5	7.06	0.566	219.7	3.57	14.16	63.7	
0906	3.0	7.08	0.568	62.1	3.55	14.26	67.2	
0909	4.5	7.09	0.569	34.6	3.51	14.26	72.0	
0912	6.0	7.08	0.570	24.1	3.48	14.27	75.2	
0915	7.5	7.08	0.570	18.6	3.45	14.26	78.4	
0917	9.0	7.08	0.571	9.8	3.43	14.28	81.0	
0920	10.5	7.09	0.572	5.6	3.41	14.28	82.3	
0924	12.0	7.08	0.571	3.2	3.40	14.26	83.5	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-84(68)**	Location: **Top of hill East of NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW84(68)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0848**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0830**	Purge Stop Date: **5/1/13**	Time: **0848**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **40.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0834	**4**	**7.23**	**0.491**	**116.6**	**0.37**	**13.95**	**59.3**	
0836	**6**	**7.23**	**0.486**	**106.7**	**0.37**	**13.96**	**55.2**	
0838	**8**	**7.19**	**0.483**	**105.4**	**0.38**	**13.95**	**51.6**	
0840	**10**	**7.19**	**0.480**	**98.1**	**0.38**	**13.98**	**48.3**	
0842	**12**	**7.22**	**0.479**	**82.8**	**0.39**	**14.00**	**46.1**	
0844	**14**	**7.22**	**0.477**	**80.3**	**0.39**	**13.97**	**45.1**	
0846	**16**	**7.22**	**0.476**	**78.0**	**0.39**	**13.98**	**44.2**	
0848	**18**	**7.22**	**0.476**	**79.6**	**0.39**	**13.99**	**44.0**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(39)**	Location: **4377 NOUSHWY31**		Page **1** of **1**
Sample ID: **ATR-MW85(39)-G050113**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1043**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1028**	Purge Stop Date: **5/1/13**	Time: **1043**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.22** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1031	**3**	**7.20**	**0.525**	**35.6**	**0.51**	**11.52**	**-84.1**	
1034	**6**	**7.18**	**0.526**	**19.7**	**0.29**	**11.60**	**-70.8**	
1037	**9**	**7.20**	**0.526**	**6.0**	**0.24**	**11.62**	**-64.3**	
1040	**12**	**7.20**	**0.528**	**1.2**	**0.23**	**11.71**	**-58.9**	
1043	**15**	**7.20**	**0.527**	**0.1**	**0.22**	**11.69**	**-53.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(70)**	Location: **4377 NOUSHWY31**	Page **1** of **1**
Sample ID: **ATR-MW8570)-G050113**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1110**	Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **1050**	Purge Stop Date: **5/1/13**	Time: **1110**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.44** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1054	5	7.42	0.471	12.1	0.79	11.74	-90.2	
1057	10	7.37	0.472	11.1	0.50	11.79	-109.3	
1101	15	7.31	0.484	10.6	0.32	11.91	-110.5	
1104	20	7.33	0.483	11.5	0.28	11.90	-112.1	
1107	25	7.30	0.484	11.3	0.26	11.95	-112.5	
1110	30	7.32	0.482	11.5	0.25	11.89	-112.8	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
TWB

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-85(130)**	Location: **4377 NOUSHWY31**		Page **1** of **1**
Sample ID: **ATR-MW85(130)-G050113**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1015**		Sample Collection Date: **5/1/2013**	

Purge Start Date: **5/1/13**	Time: **0940**	Purge Stop Date: **5/1/13**	Time: **1015**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.01** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **70 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0945	**10**	**7.16**	**0.690**	**435.0**	**0.20**	**11.49**	**-122.3**	
0950	**20**	**7.12**	**0.708**	**412.3**	**0.19**	**11.54**	**-140.7**	
0955	**30**	**7.09**	**0.709**	**229.0**	**0.18**	**11.61**	**-141.7**	
1000	**40**	**7.09**	**0.718**	**109.0**	**0.18**	**11.58**	**-135.4**	
1005	**50**	**7.08**	**0.717**	**31.0**	**0.18**	**11.57**	**-129.8**	
1010	**60**	**7.08**	**0.717**	**13.9**	**0.18**	**11.59**	**-126.0**	
1015	**70**	**7.08**	**0.717**	**4.6**	**0.18**	**11.60**	**-123.8**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-89(28)**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-MW89(28)-G050713**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0854**		Sample Collection Date: **5/7/2013**	

Purge Start Date: **5/7/13**	Time: **0839**	Purge Stop Date: **5/7/13**	Time: **0854**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.79** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **15 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0842	**3**	**6.98**	**0.378**	**40.8**	**0.23**	**13.21**	**-135.4**	
0845	**6**	**6.97**	**0.378**	**16.5**	**0.18**	**13.28**	**-139.3**	
0848	**9**	**6.97**	**0.378**	**10.1**	**0.16**	**13.35**	**-141.7**	
0851	**12**	**6.97**	**0.379**	**6.6**	**0.15**	**13.37**	**-143.0**	
0854	**15**	**6.97**	**0.378**	**4.7**	**0.14**	**13.41**	**-144.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-MW89(28)-G050713R'.

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-1**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM1-G050313**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0911**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0855**	Purge Stop Date: **5/3/13**	Time: **0911**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **12.48** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **8 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0859	**2**	**6.97**	**0.486**	**25.4**	**0.39**	**12.47**	**-127.9**	
0903	**4**	**6.99**	**0.484**	**6.1**	**0.29**	**12.55**	**-132.7**	
0907	**6**	**6.99**	**0.481**	**3.0**	**0.24**	**12.61**	**-135.7**	
0911	**8**	**6.99**	**0.480**	**1.4**	**0.19**	**12.61**	**-137.7**	

Comments: **NM = Not Measured, SWL = Static Water Level**
A replicate sample was collected along with the primary sample, 'ATR-PM1-G050313R'.

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-2**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM2-G050313**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0952**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0928**	Purge Stop Date: **5/3/13**	Time: **0952**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **14.09** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0932	**2**	**6.72**	**0.575**	**116.9**	**0.23**	**12.60**	**-113.0**	
0936	**4**	**6.78**	**0.540**	**78.9**	**0.13**	**12.79**	**-120.0**	
0940	**6**	**6.84**	**0.525**	**27.5**	**0.13**	**12.87**	**-122.7**	
0944	**8**	**6.80**	**0.517**	**18.3**	**0.12**	**12.93**	**-124.1**	
0948	**10**	**6.80**	**0.513**	**11.5**	**0.11**	**12.89**	**-125.3**	
0952	**12**	**6.80**	**0.512**	**8.6**	**0.11**	**12.87**	**-125.5**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **PM-3**	Location: **Behind TORX facility**		Page **1** of **1**
Sample ID: **ATR-PM-3-G050313**		Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1025**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **1005**	Purge Stop Date: **5/3/13**	Time: **1025**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **23.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **10 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1009	**2**	**6.63**	**0.504**	**110.1**	**0.42**	**14.45**	**-53.6**	
1013	**4**	**6.63**	**0.504**	**35.1**	**0.30**	**14.50**	**-57.2**	
1017	**6**	**6.62**	**0.498**	**10.8**	**0.18**	**14.59**	**-60.6**	
1021	**8**	**6.61**	**0.498**	**6.0**	**0.20**	**14.60**	**-62.1**	
1025	**10**	**6.61**	**0.499**	**4.8**	**0.21**	**14.60**	**-62.1**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(16.5)**	Location: **4377 N Old US 31, East of TORX Facility**	Page **1** of **1**
Sample ID: **ATR-ZVI1(16.5)-G050313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **0942**	Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0920**	Purge Stop Date: **5/3/13**	Time: **0942**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **8.61** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **22 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0922	2	7.39	0.459	427.6	0.21	11.56	-150.4	
0924	4	7.40	0.461	290.9	0.21	11.62	-155.7	
0926	6	7.42	0.461	176.5	0.21	11.55	-159.0	
0928	8	7.45	0.463	111.8	0.21	11.61	-162.9	
0930	10	7.47	0.463	58.7	0.21	11.61	-166.0	
0932	12	7.47	0.464	43.0	0.20	11.63	-166.7	
0934	14	7.49	0.464	28.2	0.20	11.66	-168.0	
0936	16	7.50	0.465	18.5	0.20	11.65	-169.3	
0938	18	7.50	0.465	11.6	0.20	11.65	-169.4	
0940	20	7.48	0.465	10.0	0.20	11.61	-169.5	
0942	22	7.49	0.464	4.6	0.20	11.60	-170.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-1(34.5)**	Location: **4377 N Old US 31, East of TORX Facility**		Page **1** of **1**
Sample ID: **ATR-ZVI1(34.5)-G050313**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1004**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **0950**	Purge Stop Date: **5/3/13**	Time: **1004**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **8.46** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **14 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0952	2	7.49	0.359	16.3	0.20	12.85	-130.1	
0954	4	7.47	0.361	14.0	0.20	12.96	-126.3	
0956	6	7.44	0.363	4.3	0.20	12.99	-122.3	
0958	8	7.45	0.364	0.5	0.20	12.98	-119.9	
1000	10	7.40	0.366	0.0	0.20	12.99	-117.6	
1002	12	7.40	0.367	0.0	0.19	13.00	-116.8	
1004	14	7.39	0.367	0.0	0.19	13.03	-115.7	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(17.5)**	Location: **4377 N Old US 31, East of TORX Facility**		Page **1** of **1**
Sample ID: **ATR-ZVI2(17.5)-G050313**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1035**		Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **1017**	Purge Stop Date: **5/3/13**	Time: **1035**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.49** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **18 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1020	**3**	**7.32**	**0.428**	**235.9**	**0.20**	**11.89**	**-133.1**	
1023	**6**	**7.32**	**0.428**	**89.2**	**0.20**	**11.97**	**-134.8**	
1026	**9**	**7.33**	**0.428**	**30.6**	**0.20**	**11.94**	**-134.5**	
1029	**12**	**7.31**	**0.428**	**11.0**	**0.20**	**12.01**	**-134.2**	
1032	**15**	**7.33**	**0.428**	**6.7**	**0.19**	**11.97**	**-134.5**	
1035	**18**	**7.34**	**0.428**	**3.6**	**0.19**	**11.95**	**-134.2**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **ZVI-2(32.5)**	Location: **4377 N Old US 31, East of TORX Facility**	Page **1** of **1**
Sample ID: **ATR-ZVI2(32.5)-G050313**	Sampler: **Dwayne Gross**	
Sample Collection Time: **1110**	Sample Collection Date: **5/3/2013**	

Purge Start Date: **5/3/13**	Time: **1047**	Purge Stop Date: **5/3/13**	Time: **1059**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator, YSI 6920 Water Quality Meter w/ Flow Cell**

Pre-Purge SWL: **9.40** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1050	3	7.27	0.482	88.1	0.20	13.05	-132.0	
1053	6	7.25	0.505	20.3	0.19	13.08	-129.2	
1056	9	7.23	0.507	3.4	0.19	13.12	-126.6	
1059	12	7.23	0.508	0.5	0.19	13.10	-125.6	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **4377 NOHWY 31**	Location: **4377 N. Old Highway 31**		Page **1** of **1**
Sample ID: **ATR-4377NOHWY31-G050613**		Sampler: **Dwayne Gross**	
Sample Collection Time: **1550**		Sample Collection Date: **5/6/2013**	

Purge Start Date: **5/6/13**	Time: **1500**	Purge Stop Date: **5/6/13**	Time: **1550**

Casing Diameter: **5-inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping**

Equipment: **Submersible Pump (household), YSI 6920 Water Quality Meter**

Pre-Purge SWL: **NM** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **~5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **~250 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1510	**50**	**7.43**	**0.535**	**0.0**	**0.93**	**13.46**	**-37.2**	
1520	**100**	**7.26**	**0.518**	**0.0**	**0.63**	**12.60**	**-85.9**	
1530	**150**	**7.24**	**0.504**	**0.0**	**0.37**	**12.41**	**-91.0**	
1540	**200**	**7.25**	**0.500**	**0.0**	**0.35**	**12.21**	**-89.8**	
1550	**250**	**7.23**	**0.497**	**0.0**	**0.34**	**12.23**	**-91.3**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-26(58.2)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW26(58.2)-G060413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **0927**	Sample Collection Date: **6/4/2013**	

Purge Start Date: **6/4/13**	Time: **0912**	Purge Stop Date: **6/4/13**	Time: **0927**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **9.25** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **30 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0915	**6**	**6.56**	**0.398**	**NM**	**4.00**	**13.04**	**118.2**	
0918	**12**	**6.75**	**0.409**	**NM**	**1.02**	**13.00**	**117.4**	
0921	**18**	**6.89**	**0.417**	**NM**	**0.59**	**12.99**	**109.9**	
0924	**24**	**6.91**	**0.417**	**NM**	**0.58**	**12.98**	**107.0**	
0927	**30**	**6.93**	**0.417**	**NM**	**0.55**	**12.97**	**105.4**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
ADG

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-30(41.1)**	Location: **Airvac (4081 N Old US 31)**	Page **1** of **1**
Sample ID: **ATR-MW30(41.1)-G060413**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1002**	Sample Collection Date: **6/4/2013**	

Purge Start Date: **6/4/13**	Time: **0950**	Purge Stop Date: **6/4/13**	Time: **1002**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **18.61** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1 gallon/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
0953	3	6.82	0.504	NM	0.73	11.65	124.6	
0956	6	6.87	0.505	NM	0.52	11.64	119.5	
0959	9	6.87	0.506	NM	0.51	11.70	113.4	
1002	12	6.87	0.506	NM	0.50	11.71	108.4	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: RLB
Checked by: WDG
WDG

Monitoring Well & Vertical Aquifer Sample
Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-15**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW15-G082213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1923**	Sample Collection Date: **7/22/2013**	

Purge Start Date: **7/22/13**	Time: **1915**	Purge Stop Date: **7/22/13**	Time: **1923**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **8.41** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **1.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **12 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1917	**3**	**7.36**	**0.461**	**NM**	**NM**	**14.1**	**NM**	
1919	**6**	**7.36**	**0.462**	**NM**	**NM**	**14.1**	**NM**	
1921	**9**	**7.36**	**0.464**	**NM**	**NM**	**14.1**	**NM**	
1923	**12**	**7.36**	**0.466**	**NM**	**NM**	**14.1**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 33591212618

Well No.: **MW-24(24.9)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW24(24.9)-G082213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1952**	Sample Collection Date: **7/22/2013**	

Purge Start Date: **7/22/13**	Time: **1940**	Purge Stop Date: **7/22/13**	Time: **1952**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **19.58** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **0.5 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **6 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1944	**2**	**7.37**	**0.597**	**NM**	**NM**	**14.3**	**NM**	
1948	**4**	**7.30**	**0.610**	**NM**	**NM**	**13.6**	**NM**	
1952	**6**	**7.29**	**0.628**	**NM**	**NM**	**13.4**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB
RLB

Monitoring Well & Vertical Aquifer Sample Development and Collection Log

TORX facility - Rochester, IN - 3359122618

Well No.: **MW-25(45.2)**	Location: **4377 N Old US 31, East of TORX facility**	Page **1** of **1**
Sample ID: **ATR-MW25(45.2)-G082213**	Sampler: **Gregg Schoenberger**	
Sample Collection Time: **1901**	Sample Collection Date: **7/22/2013**	

Purge Start Date: **7/22/13**	Time: **1851**	Purge Stop Date: **7/22/13**	Time: **1901**

Casing Diameter: **2 Inch**	Dev Rig (Yes/No) **No**

Purge Method: **Pumping; purge minimum 3 casing volumes.**

Equipment: **Submersible Pump, Water Level Indicator,**
YSI 6920 Water Quality Meter w/ Flow Cell

Pre-Purge SWL: **7.41** Max Drawdown during pumping: **NM** ft. @ **NM** GPM
(feet below top of casing)

Estimated Discharge Rate: **2 gallons/minute**

Total Quantity of Water Bailed: **0 gallons**

Total Quantity of Water Discharged by Pumping: **20 gallons**

Disposition of Discharge Water: **IDW Holding Tank, transported and treated by Heritage Environmental, Indianapolis, IN facility.**

Approximate Time	Volume Removed (gal)	pH (S.U.)	Conduct. (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	ORP (mV)	Remarks
1853	**4**	**6.83**	**0.457**	**NM**	**NM**	**13.9**	**NM**	
1855	**8**	**7.00**	**0.457**	**NM**	**NM**	**14.0**	**NM**	
1857	**12**	**7.02**	**0.458**	**NM**	**NM**	**13.9**	**NM**	
1859	**16**	**7.03**	**0.461**	**NM**	**NM**	**14.0**	**NM**	
1901	**20**	**7.04**	**0.463**	**NM**	**NM**	**14.1**	**NM**	

Comments: **NM = Not Measured, SWL = Static Water Level**

Completed by: JGS
Checked by: RLB

RLB

APPENDIX H

MSDS – PRODUCT ABC

MSDS – ZVI

MSDS – GUAR GUM

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(as Used on Label and List)*
ABC (Anaerobic BioChem)

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's name REDOX TECH, LLC	Emergency Telephone Number 866-460-0330
Address *(Number, Street, City, State and ZIP Code)*	Telephone Number for Information 919-460-0330
1006A Morrisville Parkway, Morrisville, NC 27560	Date Prepared MAY 2004
	Signature of Preparer *(optional)*

Section II—Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Mixture of :				
Lactate salts	NA	NA		(0 to 60%)
Lactic acid esters	NA	NA		(0 to 98.5%)
Phosphate buffer	NA	NA		(0 to 0.1%)
Ferrous Iron	NA	NA		(0 to 0.1%)
Fatty Acids	NA	NA		(0 to 5%)

Section III—Physical/Chemical Characteristics

Boiling Point	> 100 C	Specific Gravity (H_2O = 1)	1.04
Vapor Pressure (mm Hg) Lactic acid esters	2.7 mbar, 20 °C	pH	6.0 to 8.0
Vapor Density (AIR = 1) Lactic acid esters	3.8	Evaporation Rate (Butyl Acetate = 1)	No information

Solubility in Water Fully soluble and miscible

Appearance and Odor Light yellow to colorless liquid, slight to mild, characteristic odor

Section IV—Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Lactic acid esters: 61 °C (ISO 2719, closed cup)	Lactic acid esters:	1.5% (100 °C)	11.4% (100 °C)

Extinguishing Media Water spray, carbon dioxide, dry powder, AFFF, foam

Special Fire Fighting Procedures

Standard procedures for chemical fires

Unusual Fire and Explosion Hazards

Thermal decomposition can release irritating gases and vapors

(Reproduce locally) OSHA 174 Sept. 1985

Section V—Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	Temperatures above 61 °C. Will hydrolyze in presence of water, acids and bases

Incompatibility *(Materials to Avoid)* Strong oxidants

Hazardous Decomposition or Byproducts no known

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI—Health Hazard Data

Route(s) of Entry		Inhalation?	Yes, esters only	Skin?	Yes	Ingestion?	Yes

Health Hazards *(Acute and Chronic)* Acid esters: Risk of irritation to eyes. Irritating to respiratory system. May degrease skin.

Carcinogenicity	None	NTP?	No	IARC Monographs?	No	OSHA Regulated?	No

Signs and Symptoms of Exposure Red irritated skin. May cause light-headedness when used in poorly ventilated area without proper vapor mask..

Medical Conditions
Generally Aggravated by Exposure Persons susceptible or sensitive to eye and respiratory irritation

Emergency and First Aid Procedures Inhalation: Move to fresh air; Skin: Wash skin immediately with water. Eyes: Flush with water for at least 15 minutes, consult physician; Ingestion: Drink water and consult physician.

Section VII—Precautions for Safe Handling and Use

Use safety glasses and latex or nitrile gloves. Work in well ventilated area.

Waste Disposal Method ABC can be disposed as waste water or landfilled when in compliance with local regulations

Precautions to Be Taken in Handling and Storing May be Flammable - Do not store near ignition sources or at elevated temperatures.

Avoid long storage times, will break down to innocuous products

Other Precautions Wear PPE when handling and keep containers tightly closed when stored.

Section VII—Control Measures

Respiratory Protection *(Specify Type)* If ventilation inadequate or in confined space, use respirator with filter (DIN 141)

Ventilation	Local Exhaust Acid esters have low vapor pressure (2.7 mbar at 20 °C) Standard HVAC conditions typically adequate	Special Ensure fumes can not reach ignition source
	Mechanical *(General)* Floor or stand fans	Other

Protective Gloves PVA, nitrile or latex	Eye Protection Safety glasses with side shields

Other Protective Clothing or Equipment

Work/Hygienic Practices Do not eat, drink or smoke while handling. Remove/wash contaminated clothing before reuse.

MATERIAL SAFETY DATA SHEET

Peerless Metal Powders & Abrasives
124 South Military
Detroit Michigan 48209
Phone # (313) 841-5400

SECTION I IDENTIFICATION

Product Name: Cast Iron Aggregate	Chemical Family: Metals
	Formula: N/A
CAS No. 65997-19-5	Date: : December 6, 2011

SECTION II INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS

Material	CAS No.	Weight %	ACGIH TLV Mg/cu m
Iron	1309-37-1	90 +	5
Carbon	7440-44-0	<4.00	3.5
Manganese	7439-96-5	<0.60	5
Silicon	7440-21-3	< 2.00	10
Chromium	7440-47-3	<0.20	0.5

* C means ceiling limit.
These are limits which shall not be exceeded.

SECTION III PHYSICAL DATA

Melting Point	Density	Appearance and Odor
Base Melt – 2750 degrees F	6.7 gm/cc	grey particles – no odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Airborne finely dispersed dust may ignite.
Extinguishing Media
Dry chemical, dry sand, graphite to smother fire

Special Fire Fighting Procedures:
Use water only in mist / fog dry application to avoid spreading powder or accumulated dust. Use self-container breathing apparatus and protective clothing.

SECTION V REACTIVE DATA

Stable under normal conditions of storage and transport. Will react with strong oxidizers.

SECTION VI HEALTH HAZARD DATA

No potential health hazards Other than those listed are known	Major Exposure Hazard	X Inhalation, Skin Contact X Eyes Contact, Indigestion

Effect Of Overexposure
Inhalation – bronchitis, siderosis
Eyes Contact – mechanical irritation

Emergency and First Aid Procedures
Inhalation – Remove to fresh air
Eye Contact – Irrigate eyes to remove dust particles

MATERIAL SAFETY DATA SHEET

Peerless Metal Powders & Abrasives
124 South Military
Detroit Michigan 48209
Phone # (313) 841-5400

SECTION VII SPILL OR LEAK PROCECURES

Avoid generation of airborne dust during clean-up process
Dispose of in accordance with local, state and federal regulations

SECTION VIII SPECIAL PROTECTION INFORMATION

As needed, use approved dust respirator and approved safety goggles (OSHA 29 CFR 1910.94).
Do not use contact lenses. Ventilation recommended.

SECTION IX SPECIAL PRECAUTIONS

Keep closed containers.
Do not store near strong oxidizers.
Use good housekeeping procedures to avoid creating dust.

The information contained herein has been complied from sources considered reliable and accurate to the best of our knowledge and belief, but is not guaranteed to be so. It relates only to the product listed and does not relate to use of the product in combination with any other material of materials or in a particular processes. Since the use of the MSDS information, the conditions of use of our product and the environment in which that product is placed are not within the control of Peerless Metal Powders and Abrasives, it is the user's obligation and duty to determine the conditions of safest use of the products used as well as the manner in which these products may be affected by the environment in which they may be used.

We urge you to review each MSDS to ensure that your uses of the product take into account the current information available on its potential hazards. It is your responsibility to convey this information to your employees, customers or any one who may be exposed to this product. Please check your files and discard any previous versions as may be applicable. If you have any questions or require additional copies, please contact our sales department.

MG Ingredients
1757 W. Brandon Blvd, STE 107
Brandon, FL 33511
Ph: (813) 661-7048 Fax: (813) 354-4647

Material Safety Data Sheet

Guar gum

Section 1 - Chemical Product and Company Identification

MSDS Name: Guar gum
Product Grades/IDs: MG250F, MG235F, MG250T, MG235T, MG270T and various other custom grades
Company Identification: MG Ingredients
1757 W. Brandon Blvd. STE 107
Brandon, FL 33511
For information, call: (813) 661-7048
Emergency Number: (813) 817-5899

Section 2 - Composition, Information

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-30-0	Guar gum	100.0	232-536-8

Hazard Symbols: None.

Section 3 - Hazards

EMERGENCY OVERVIEW

Appearance: yellowish-white powder. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Repeated inhalation of dust can cause sensitization to susceptible individuals. May cause skin sensitization by skin contact.

Potential Health Hazards
Eye: Dust may cause irritation.
Skin: May cause skin irritation. May cause sensitization by skin contact.
Ingestion: May cause irritation of the digestive tract.
Inhalation: May cause respiratory sensitization.
Chronic: Some individuals may develop a respiratory allergenic response to guar dust. Persons with a history of respiratory allergies may have those conditions aggravated by exposure to guar dust.

Section 4 - First Aid

Eyes: Flush eyes with plenty of water for at least 15 minutes. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Use agent most appropriate to extinguish fire.
Flash Point: Not available.
Auto ignition Temperature: Not available.
Explosion Limits, Lower: Not available. **Upper:** Not available.
NFPA Rating: (Estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: Store in a tightly closed bags/container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Guar gum	None listed	None listed	None listed

OSHA Vacated PELs: Guar gum: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: yellowish-white
Odor: Slight Odor
pH: 5.5-6.5
Viscosity: 500cps to 8000cps at 1% Solution, Brookfield Viscometer, Spindle# 3 or 4
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble in both Cold and Hot water

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Excess heat.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, acrid smoke and fume.
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

CAS# 9000-30-0
Oral, mouse: LD50 = 8100 mg/kg;
Oral, rabbit: LD50 = 7 gm/kg;
Oral, rat: LD50 = 6770 mg/kg;<BR.

Carcinogenicity: CAS# 9000-30-0: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Section 12 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Section 13 - Regulatory Information

US FEDERAL

TSCA
CAS# 9000-30-0 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

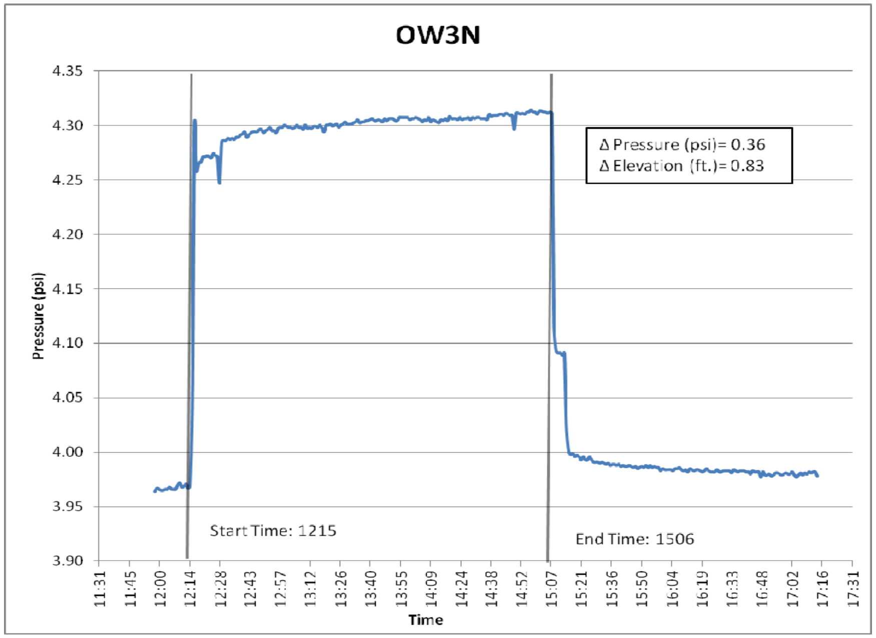
OSHA:

OSHA considers none of the chemicals in this product highly hazardous.

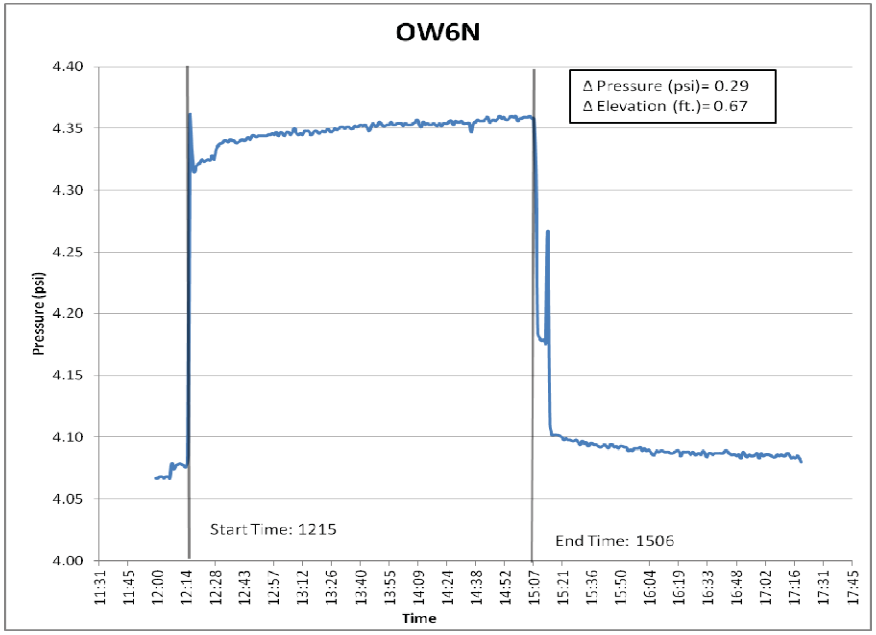
APPENDIX I

STEP AND TRACER TEST GRAPHS

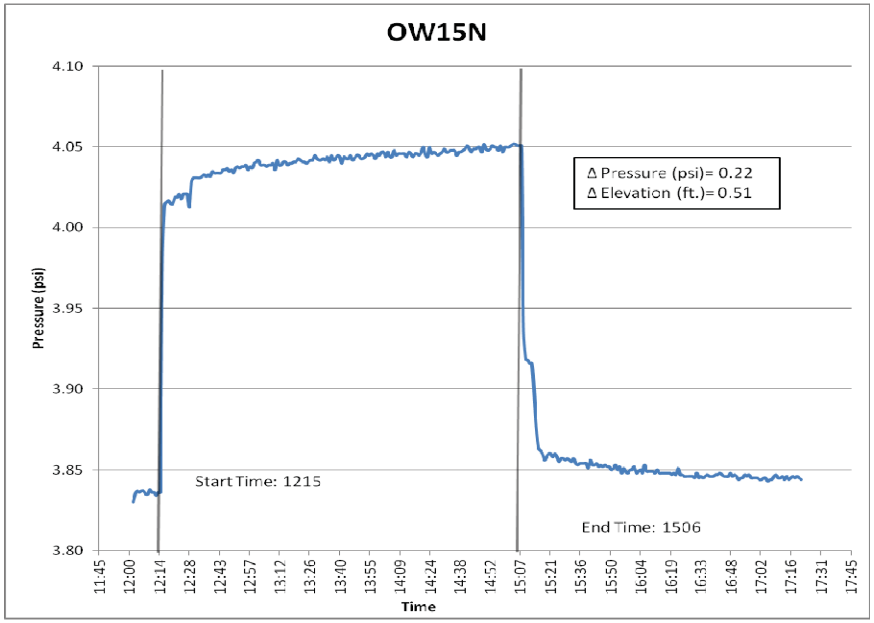
Step Test 1 (15 gpm)
North Wing



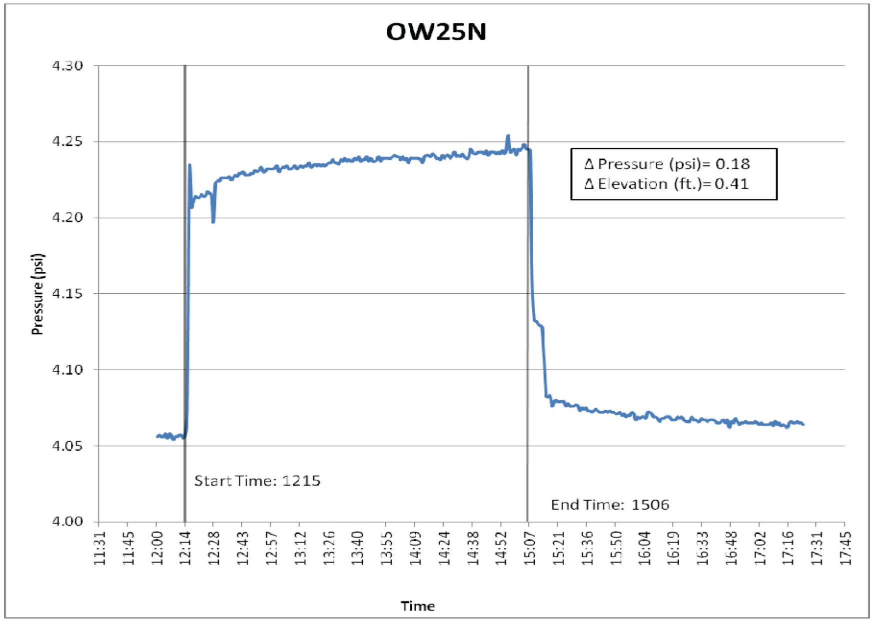
OW3N



OW6N

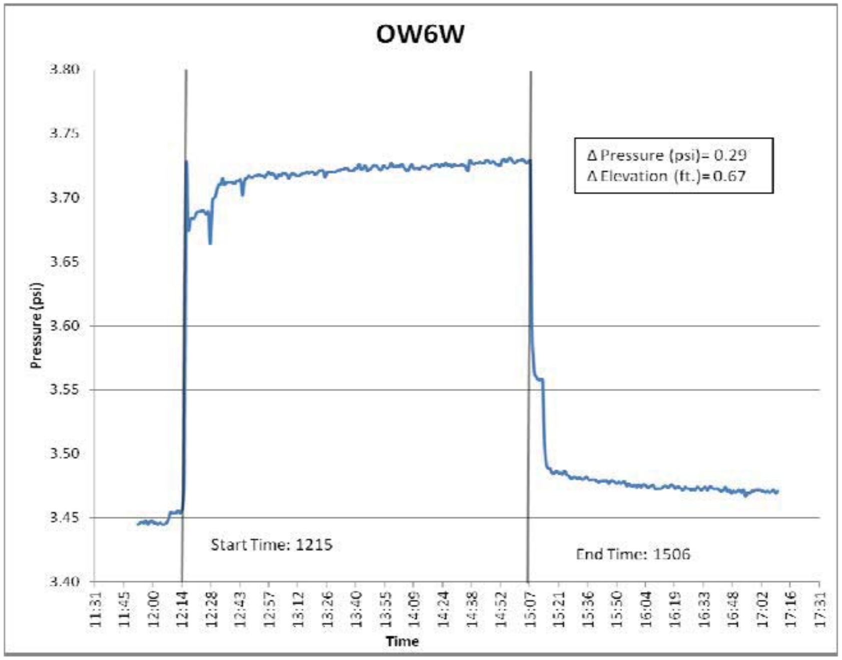


OW15N



OW25N

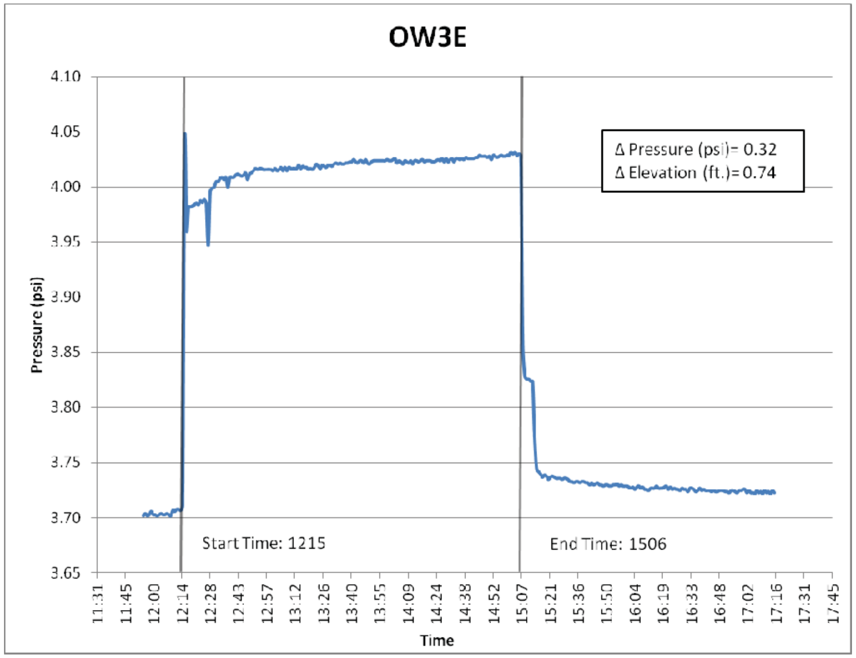
Step Test 1 (15 gpm)
East Wing


OW6W

Δ Pressure (psi)= 0.29
Δ Elevation (ft.)= 0.67

Start Time: 1215

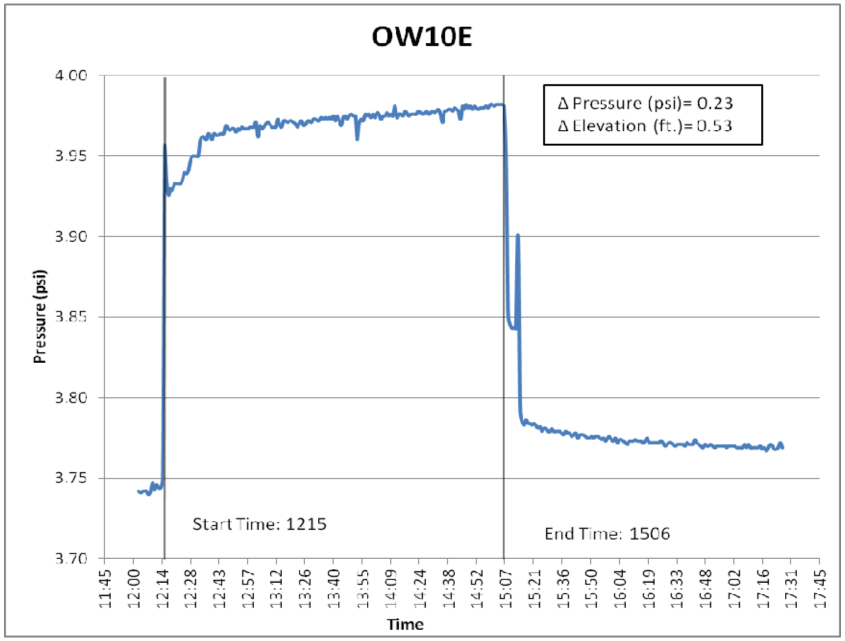
End Time: 1506


OW3E

Δ Pressure (psi)= 0.32
Δ Elevation (ft.)= 0.74

Start Time: 1215

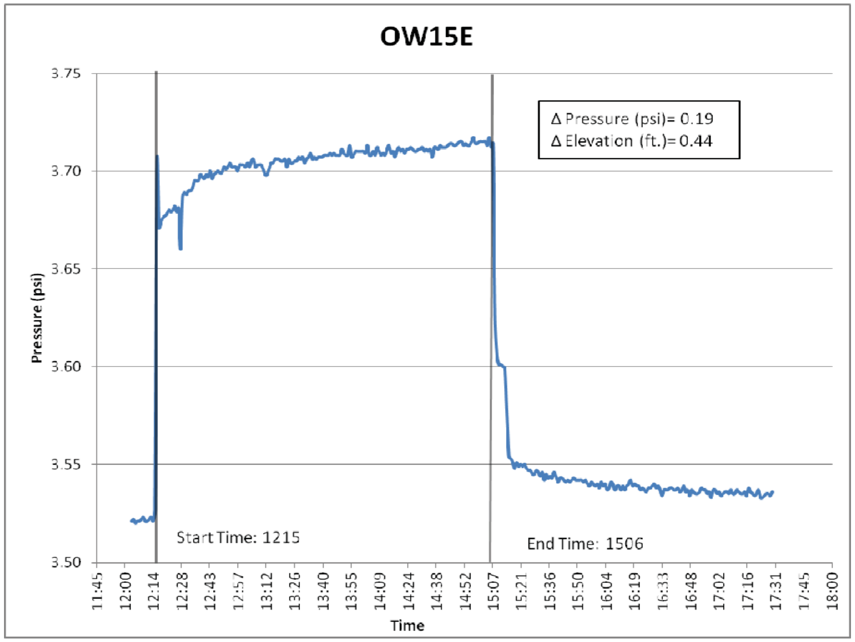
End Time: 1506


OW10E

Δ Pressure (psi)= 0.23
Δ Elevation (ft.)= 0.53

Start Time: 1215

End Time: 1506


OW15E

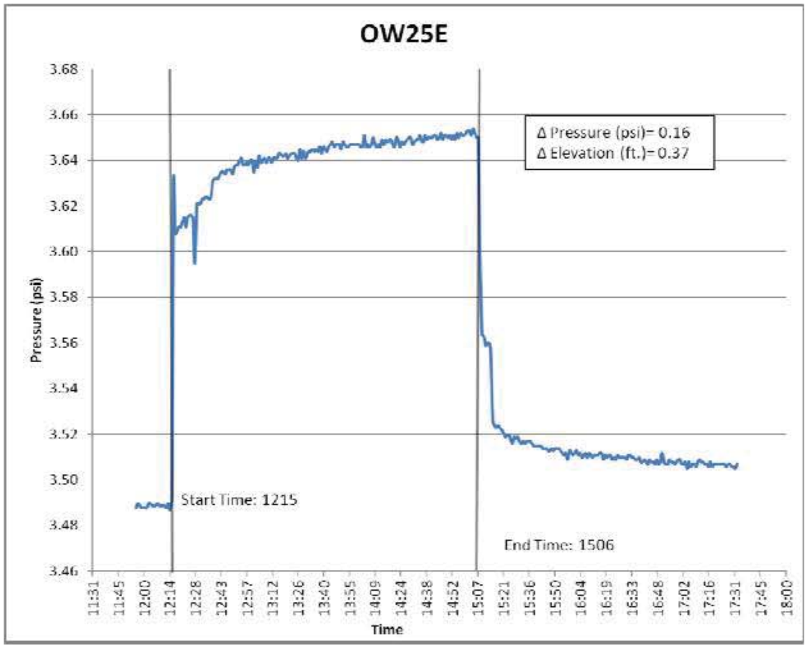
Δ Pressure (psi)= 0.19
Δ Elevation (ft.)= 0.44

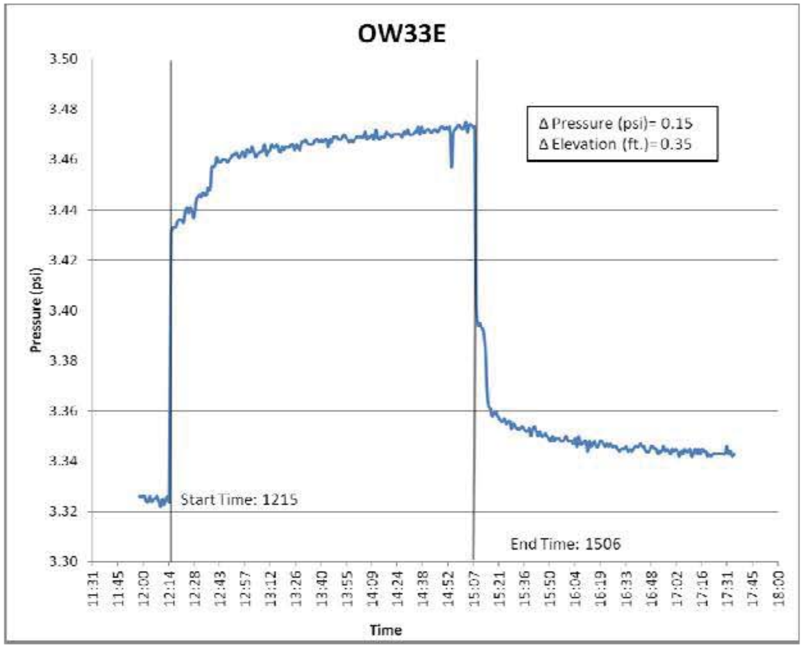
Start Time: 1215

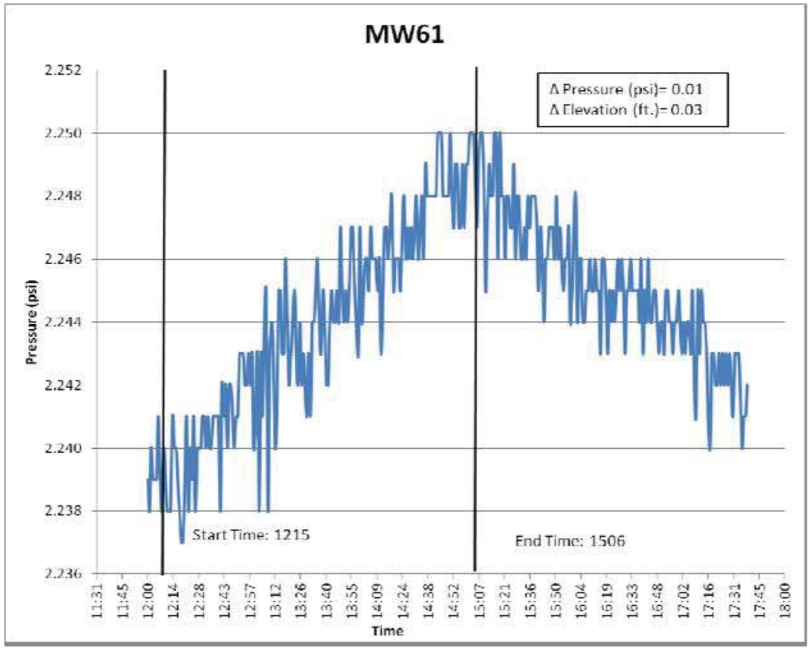
End Time: 1506

Graph I-2

Step Test 1 (15 gpm)
East Wing (continued)

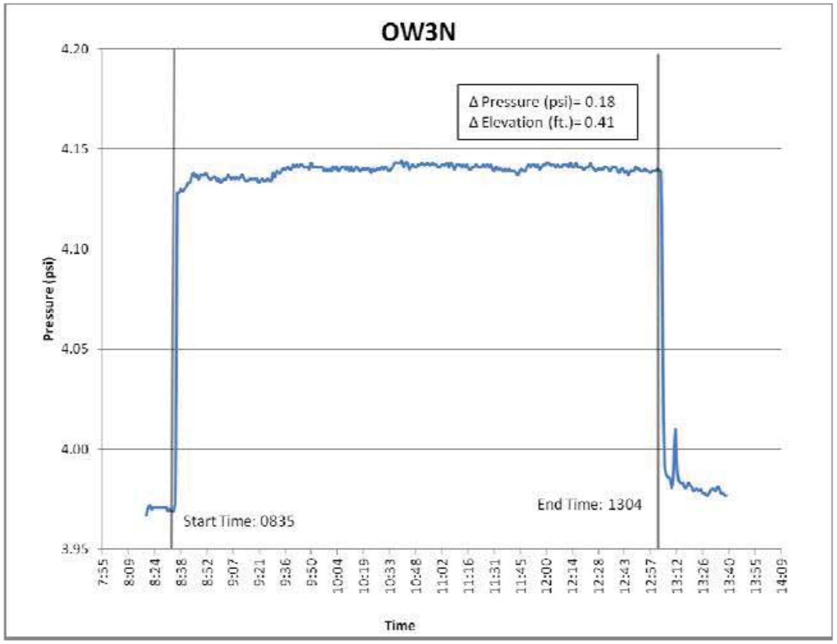


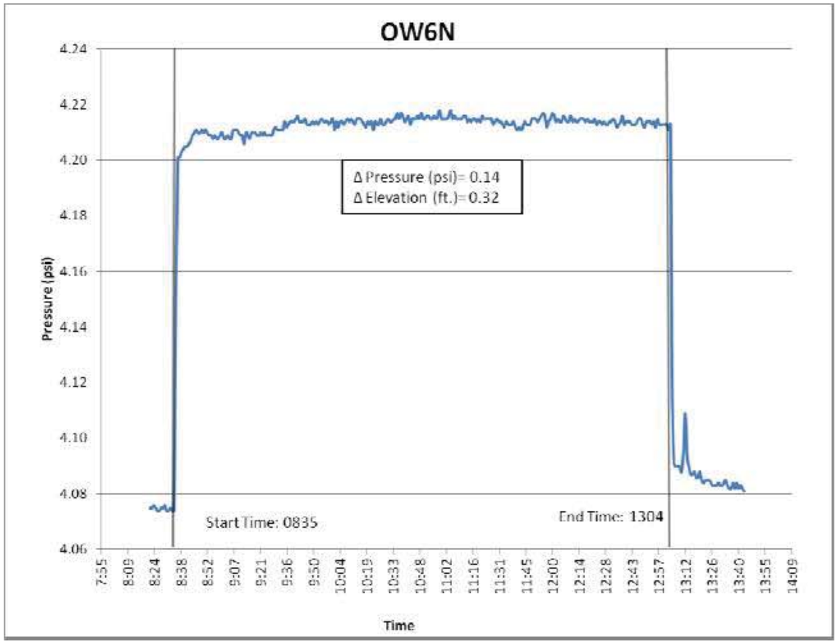


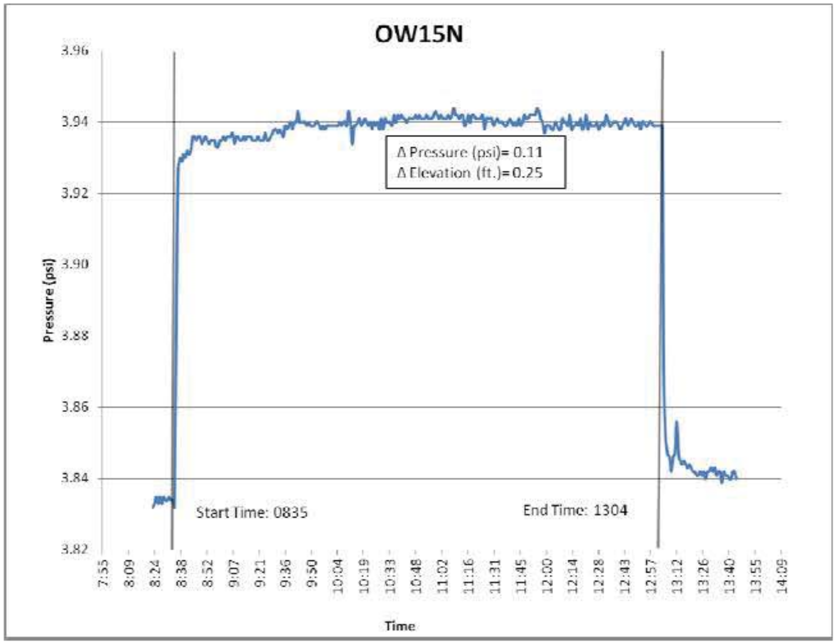


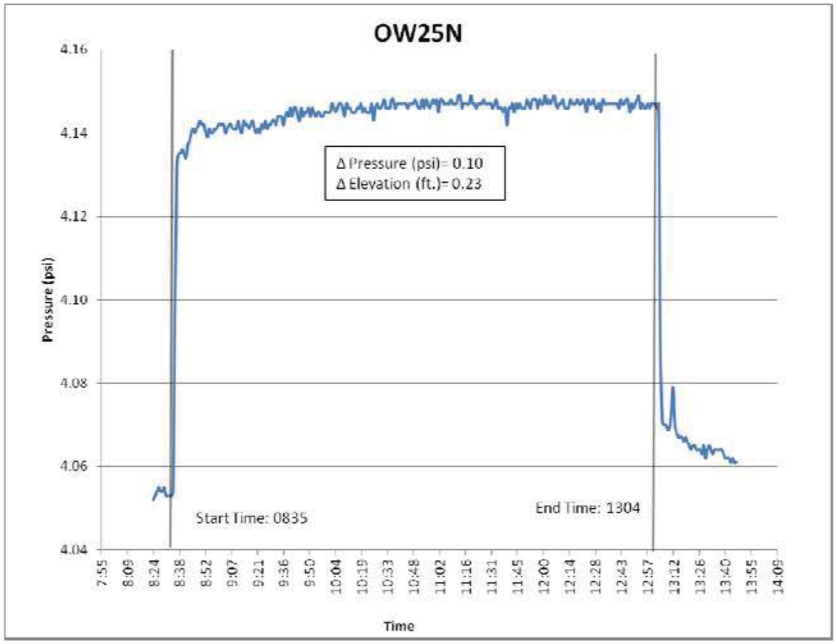
Graph I-3

Step Test 2 (7.5 gpm)
North Wing



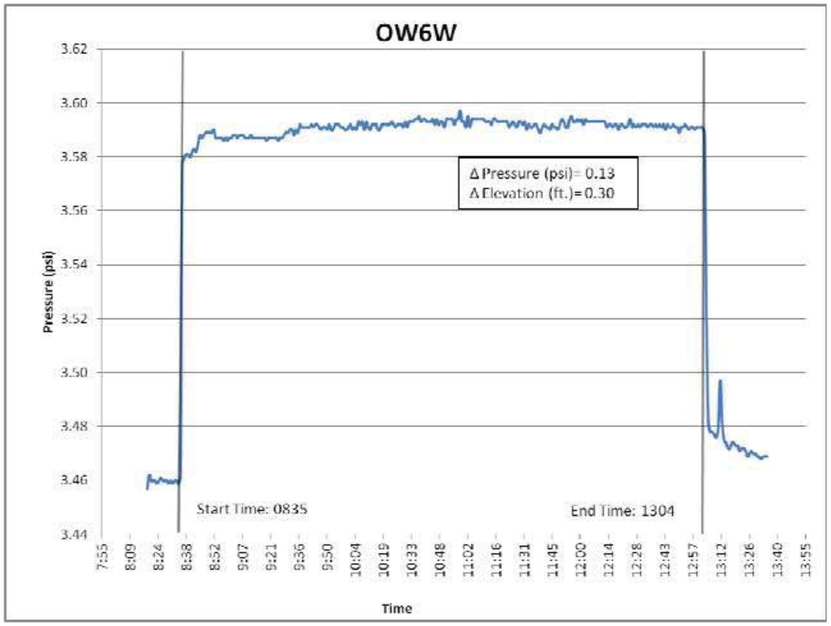


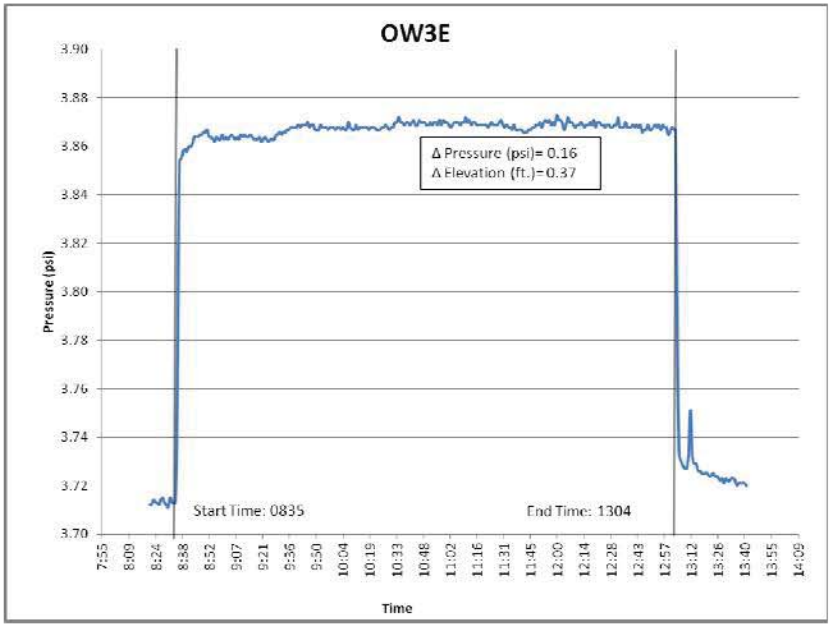


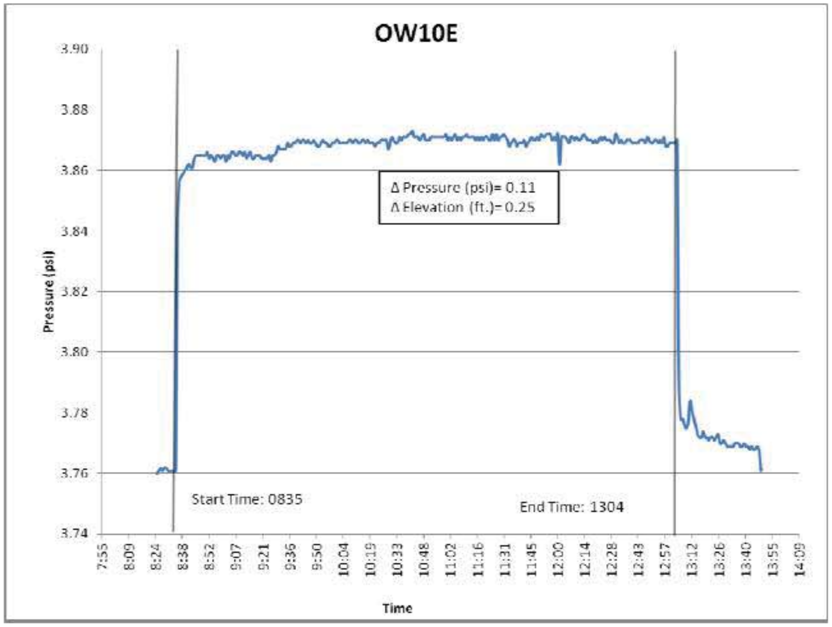


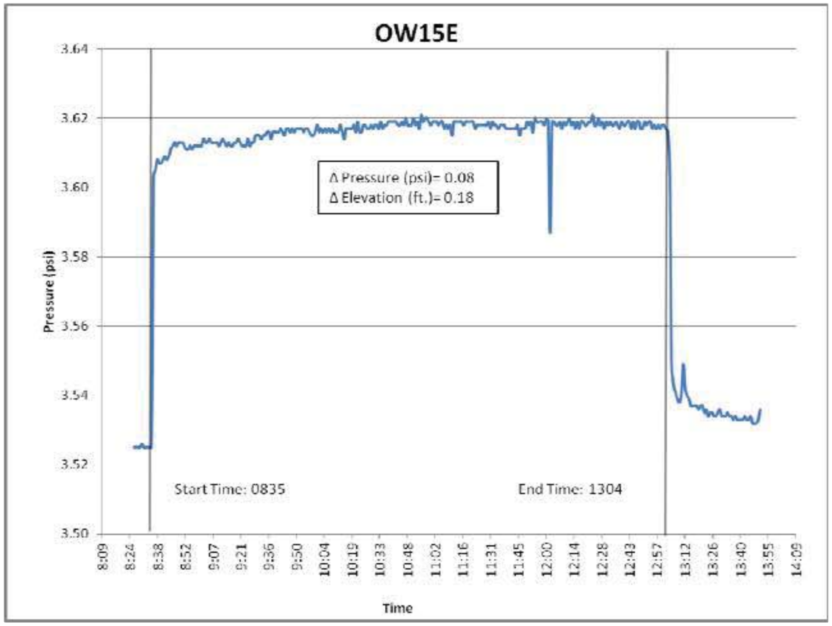
Graph I-4

Step Test 2 (7.5 gpm)
East Wing

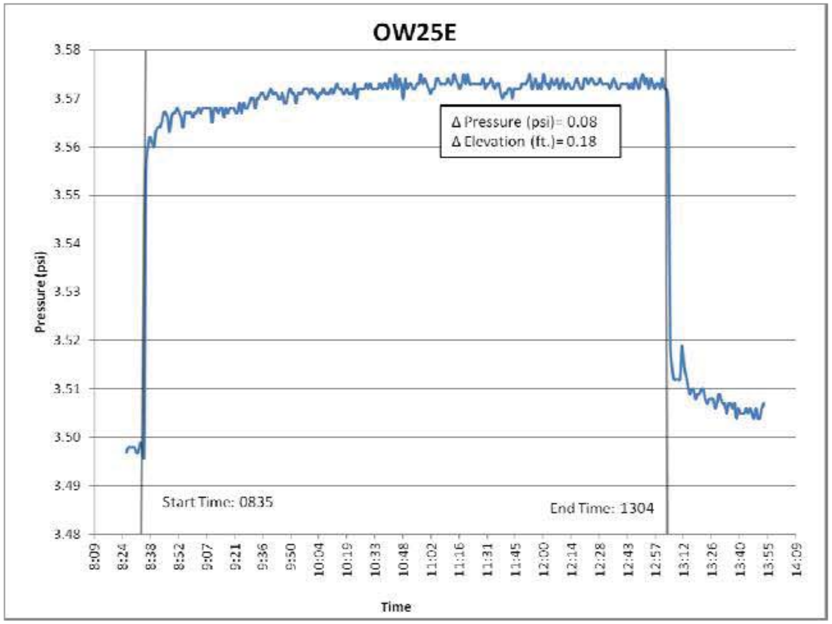


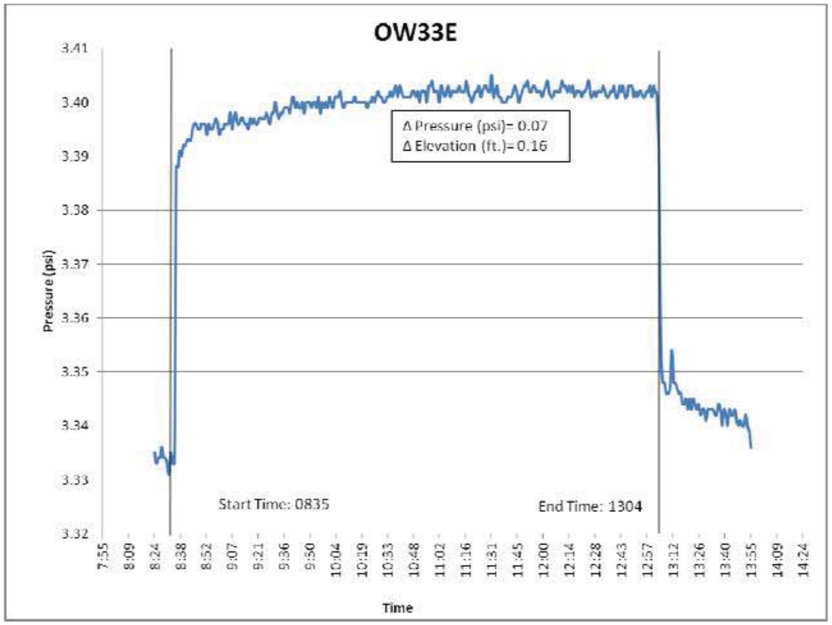


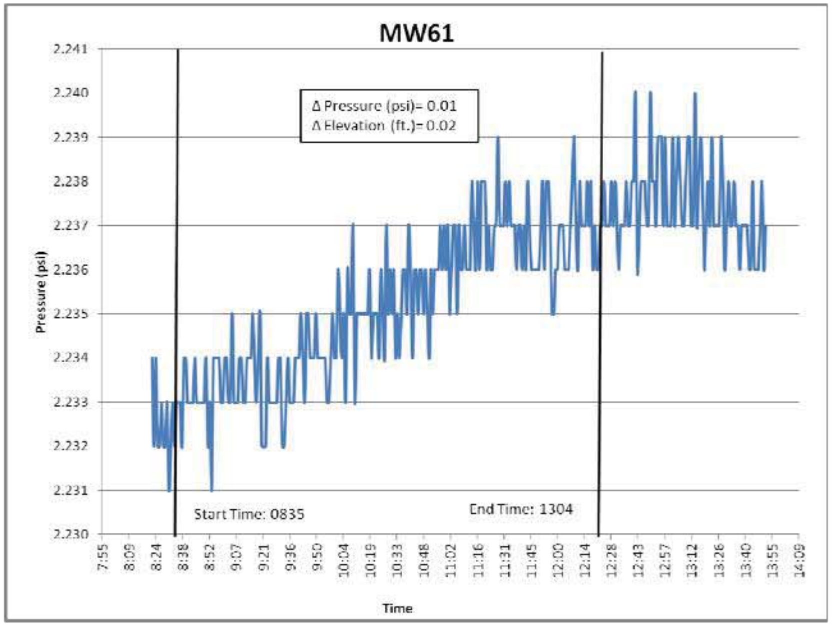




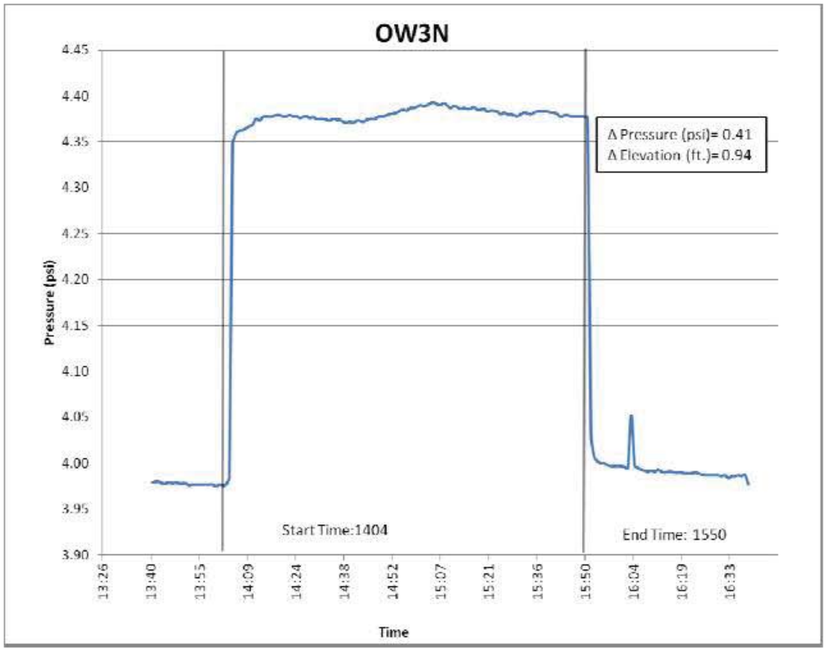
Step Test 2 (7.5 gpm)
East Wing (continued)



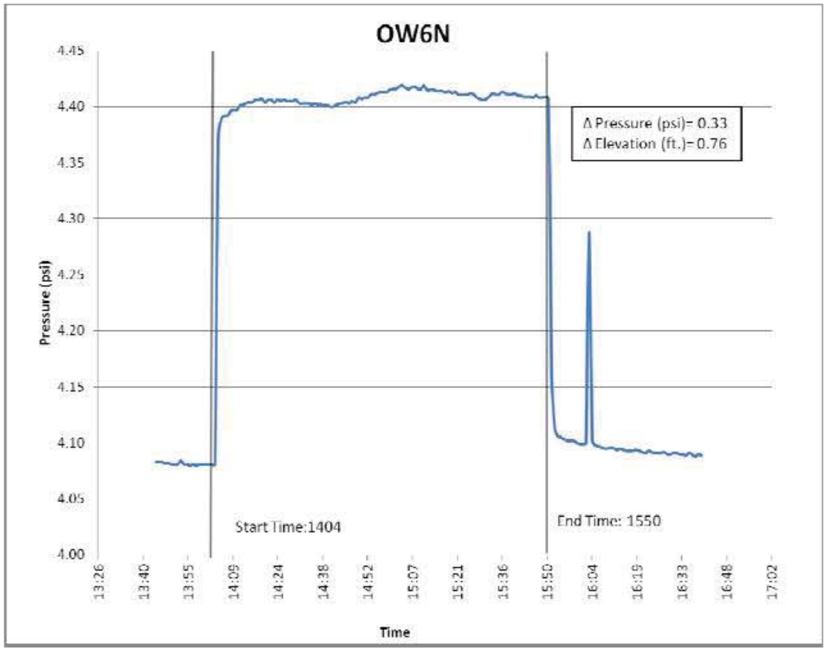




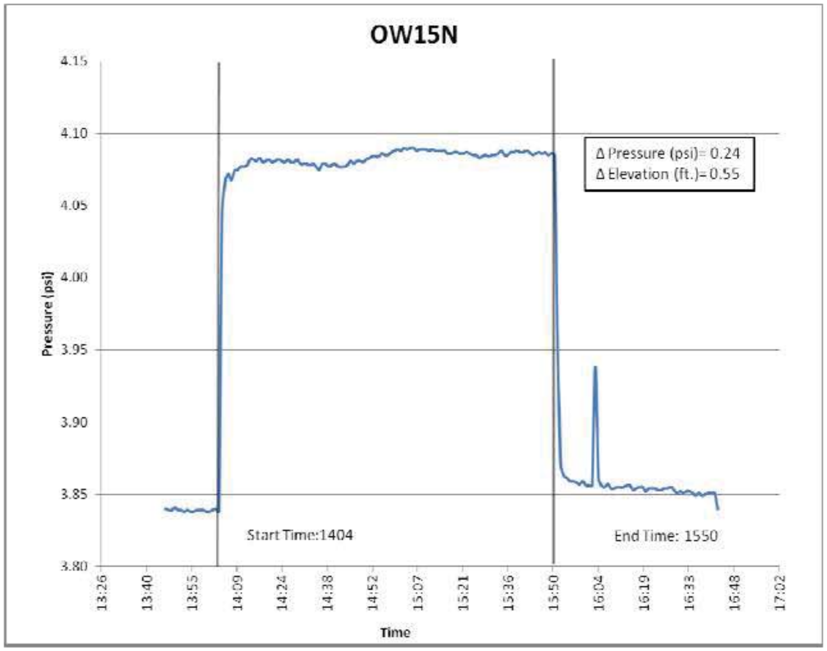
Step Test 3 (20 gpm)
North Wing



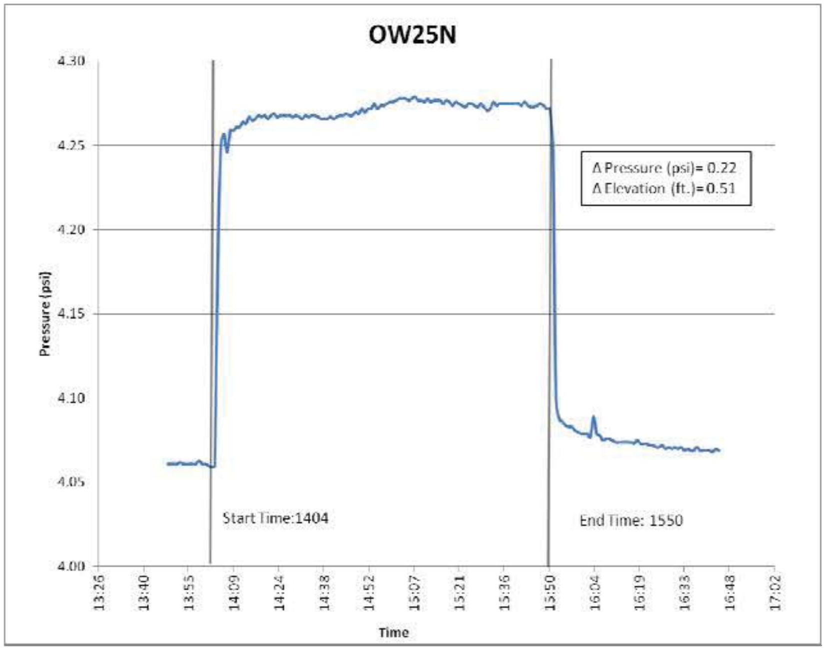
Δ Pressure (psi)= 0.41
Δ Elevation (ft.)= 0.94



Δ Pressure (psi)= 0.33
Δ Elevation (ft.)= 0.76



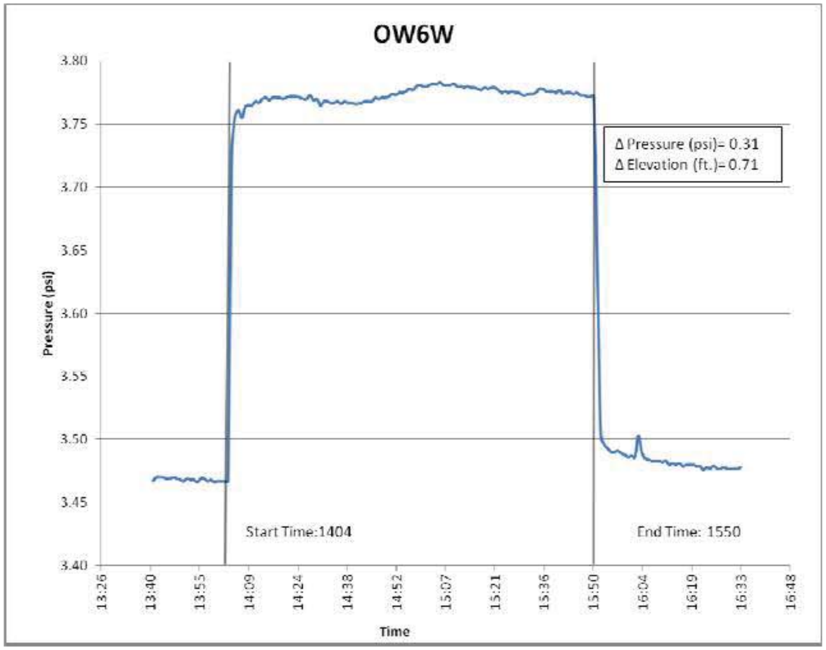
Δ Pressure (psi)= 0.24
Δ Elevation (ft.)= 0.55

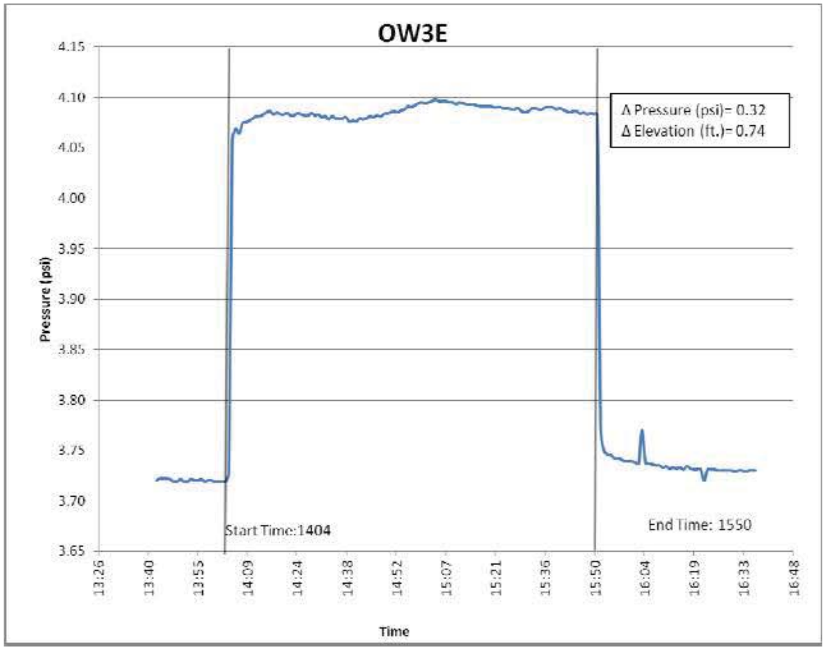


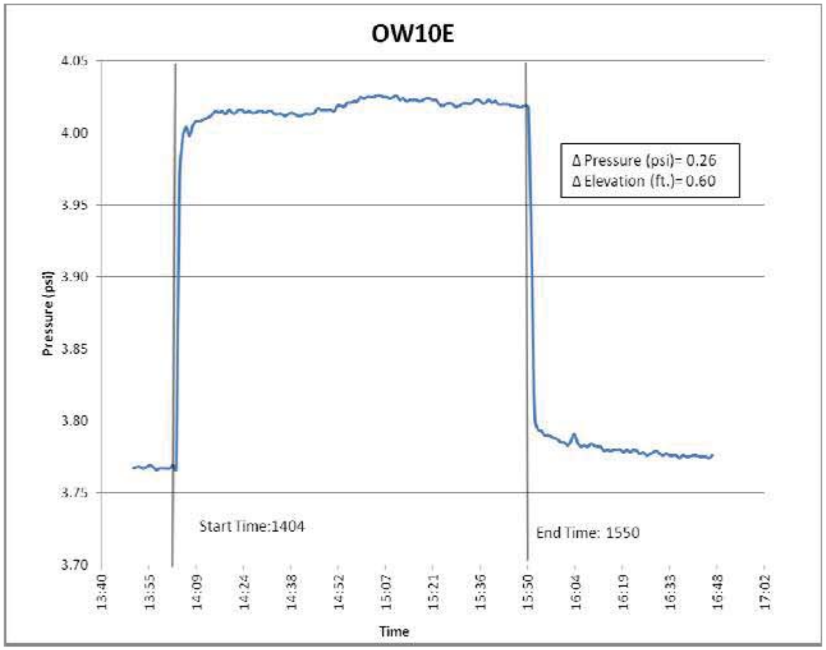
Δ Pressure (psi)= 0.22
Δ Elevation (ft.)= 0.51

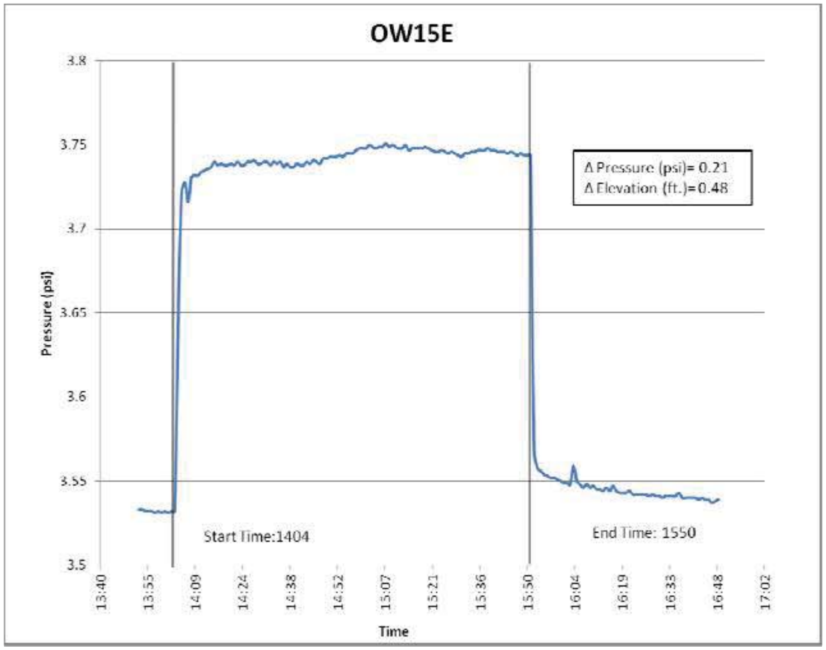
Graph I-7

Step Test 3 (20 gpm)
East Wing


OW6W

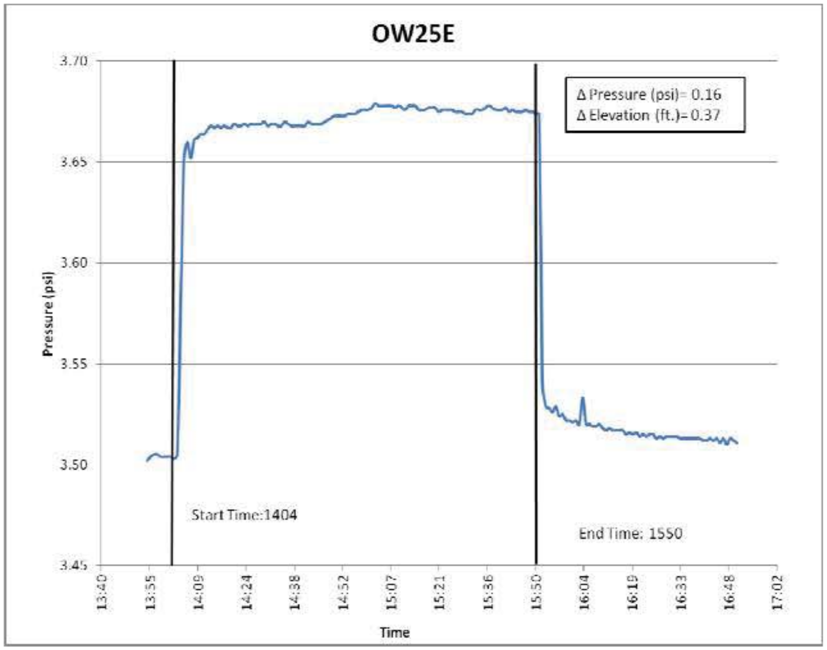

OW3E

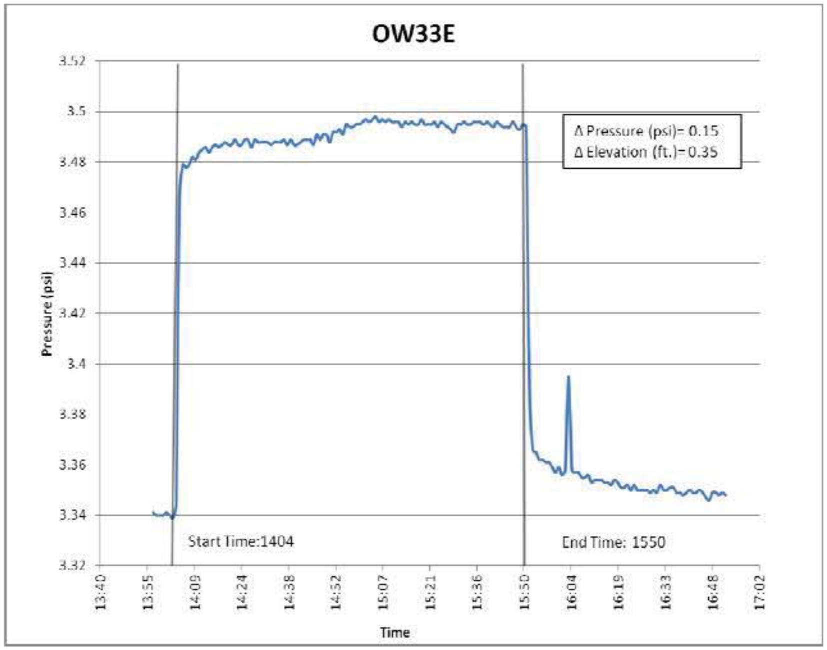

OW10E

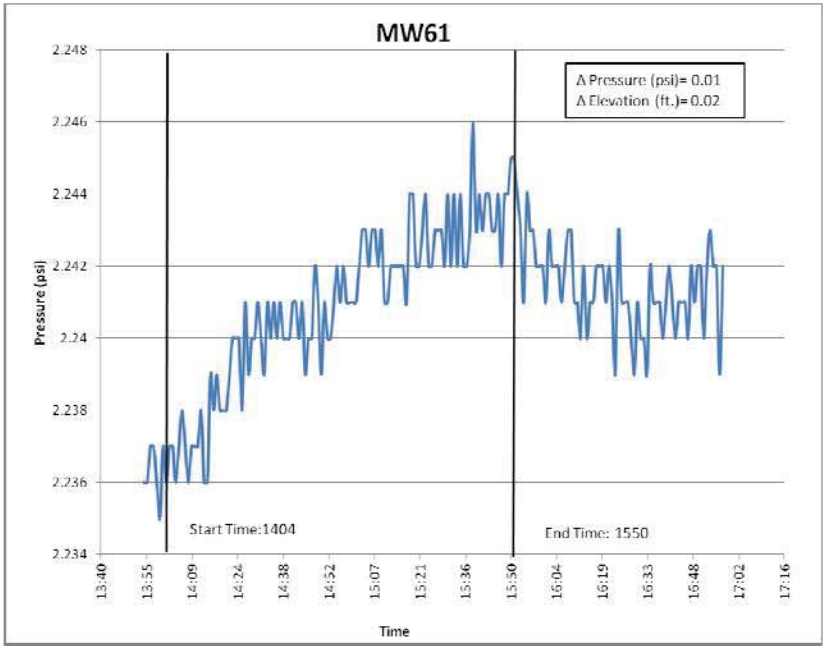

OW15E

Graph I-8

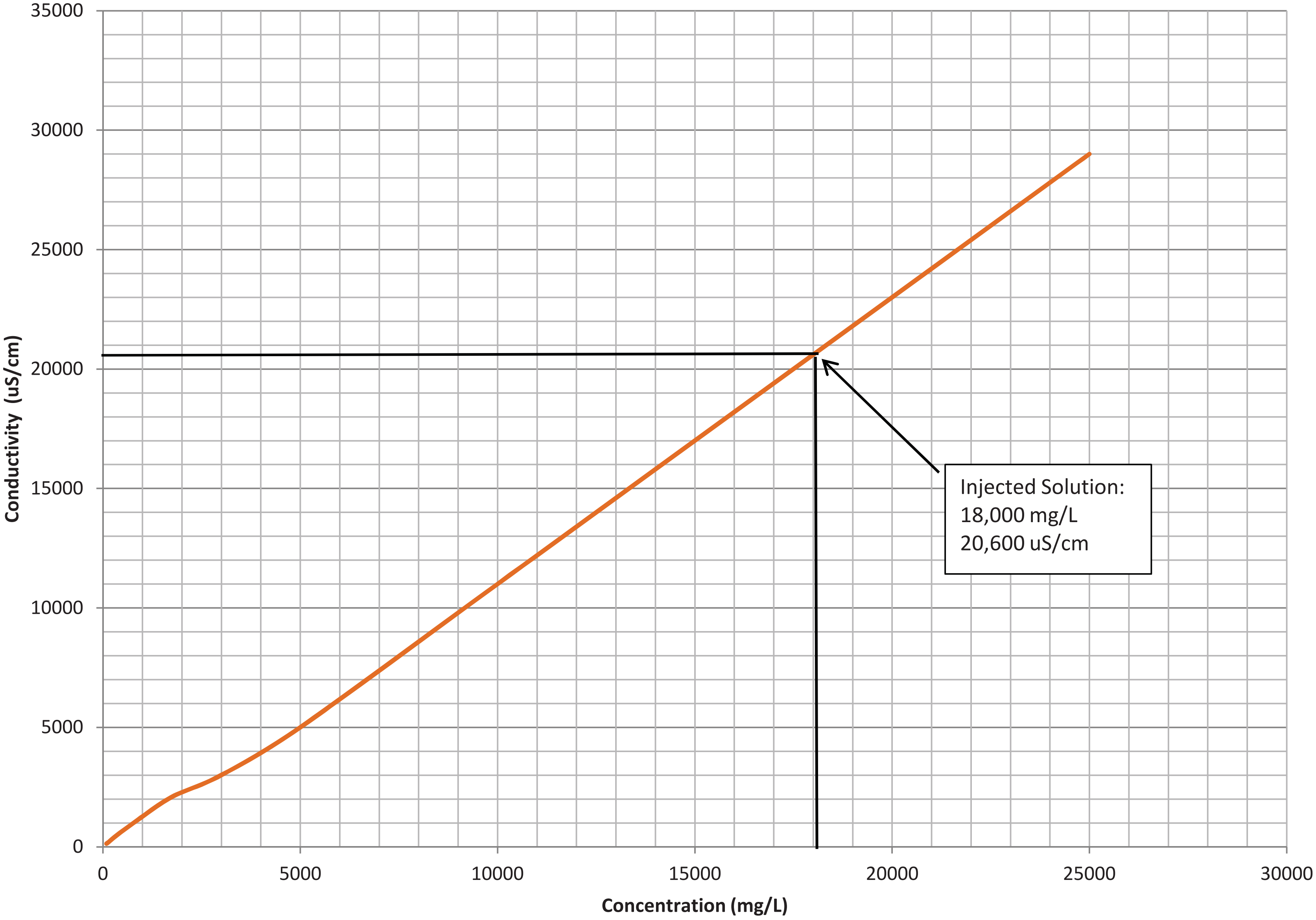
Step Test 3 (20 gpm)
East Wing (continued)







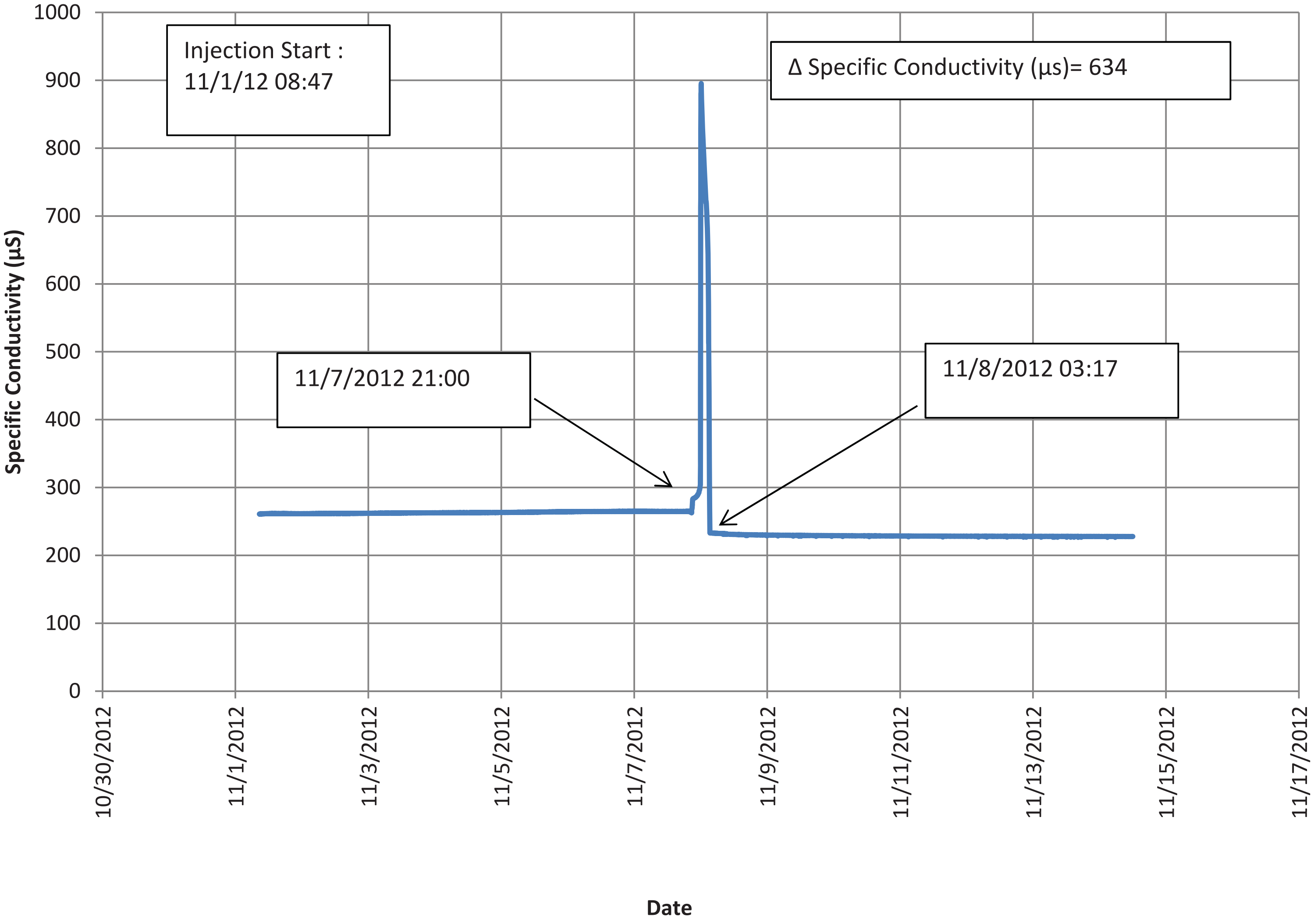
DKP Conductivity vs. Concentration



Injected Solution:
18,000 mg/L
20,600 uS/cm

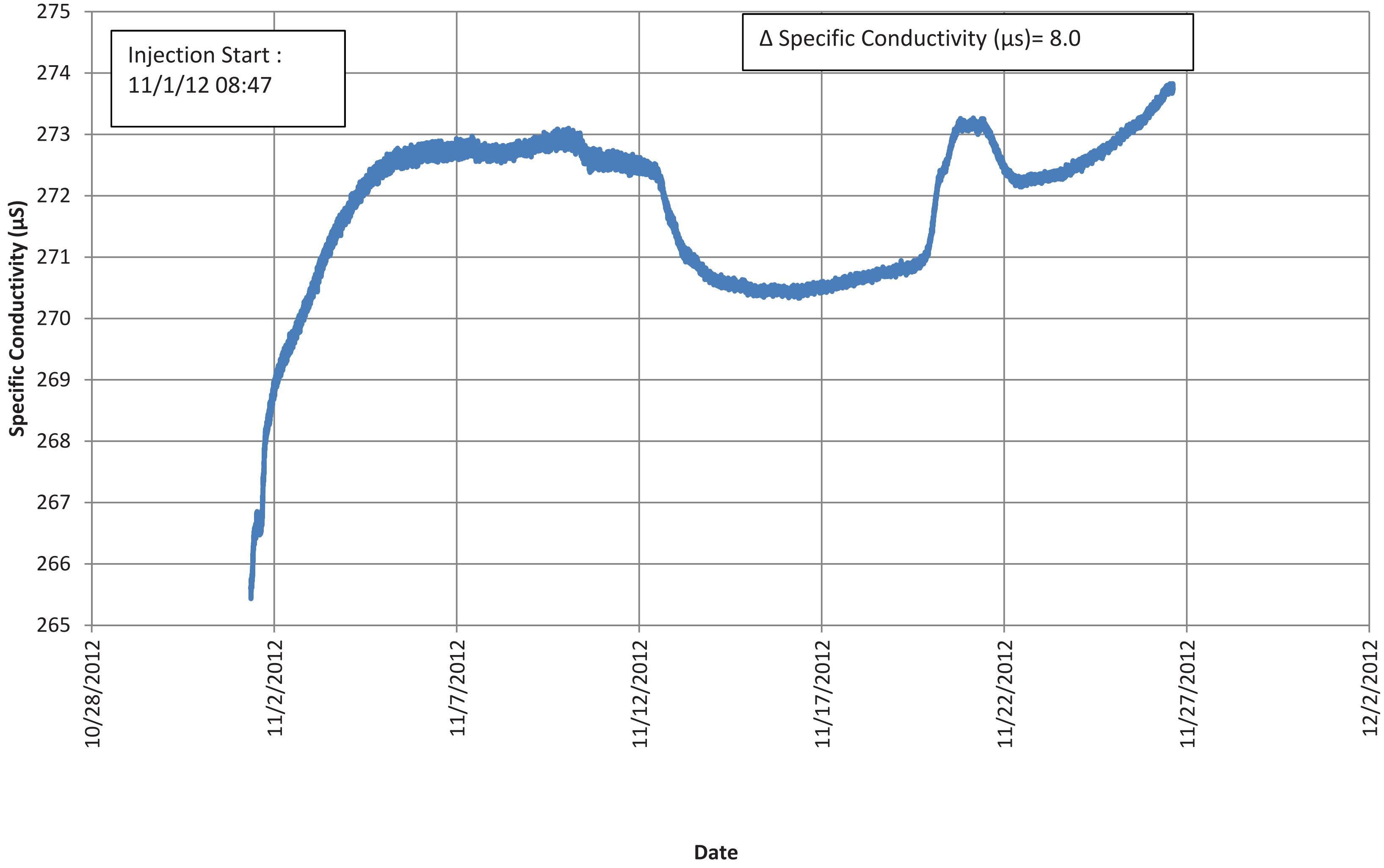
Graph I-10

Results of the Tracer Test for Upgradient Observation Well OW6W



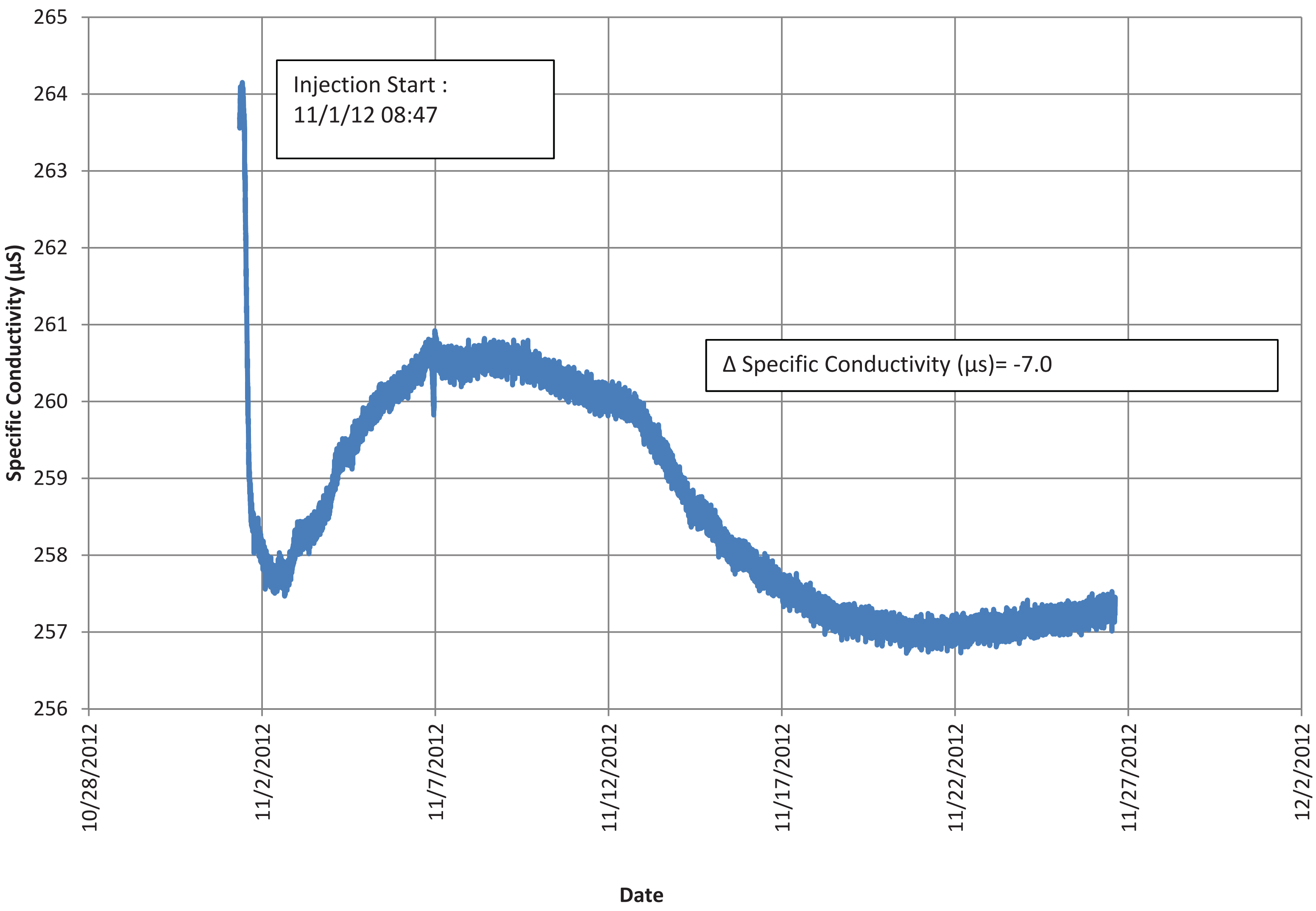
Graph I-11

Results of the Tracer Test for Observation Well OW3E



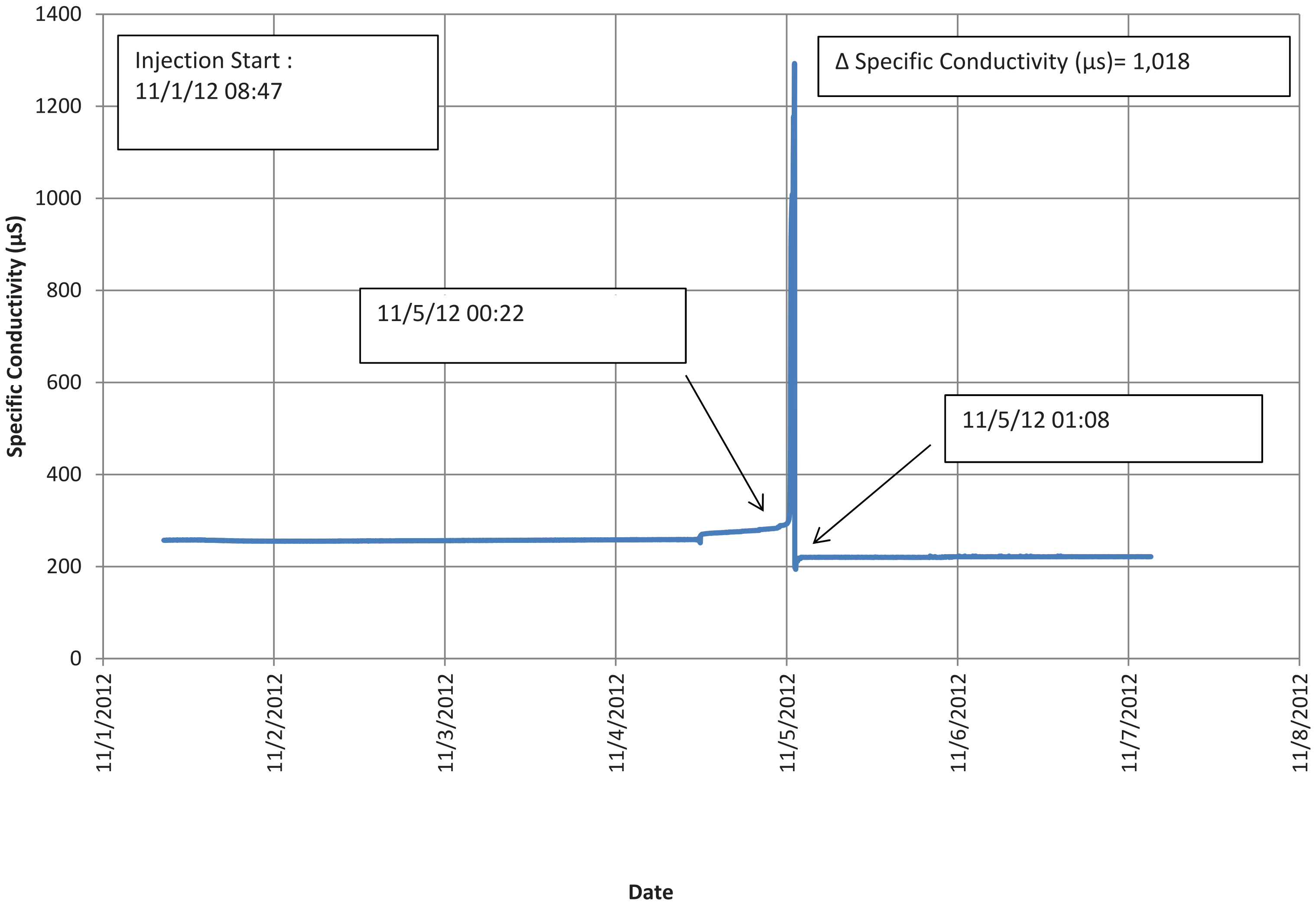
Graph I-12

Results of the Tracer Test for Observation Well OW10E



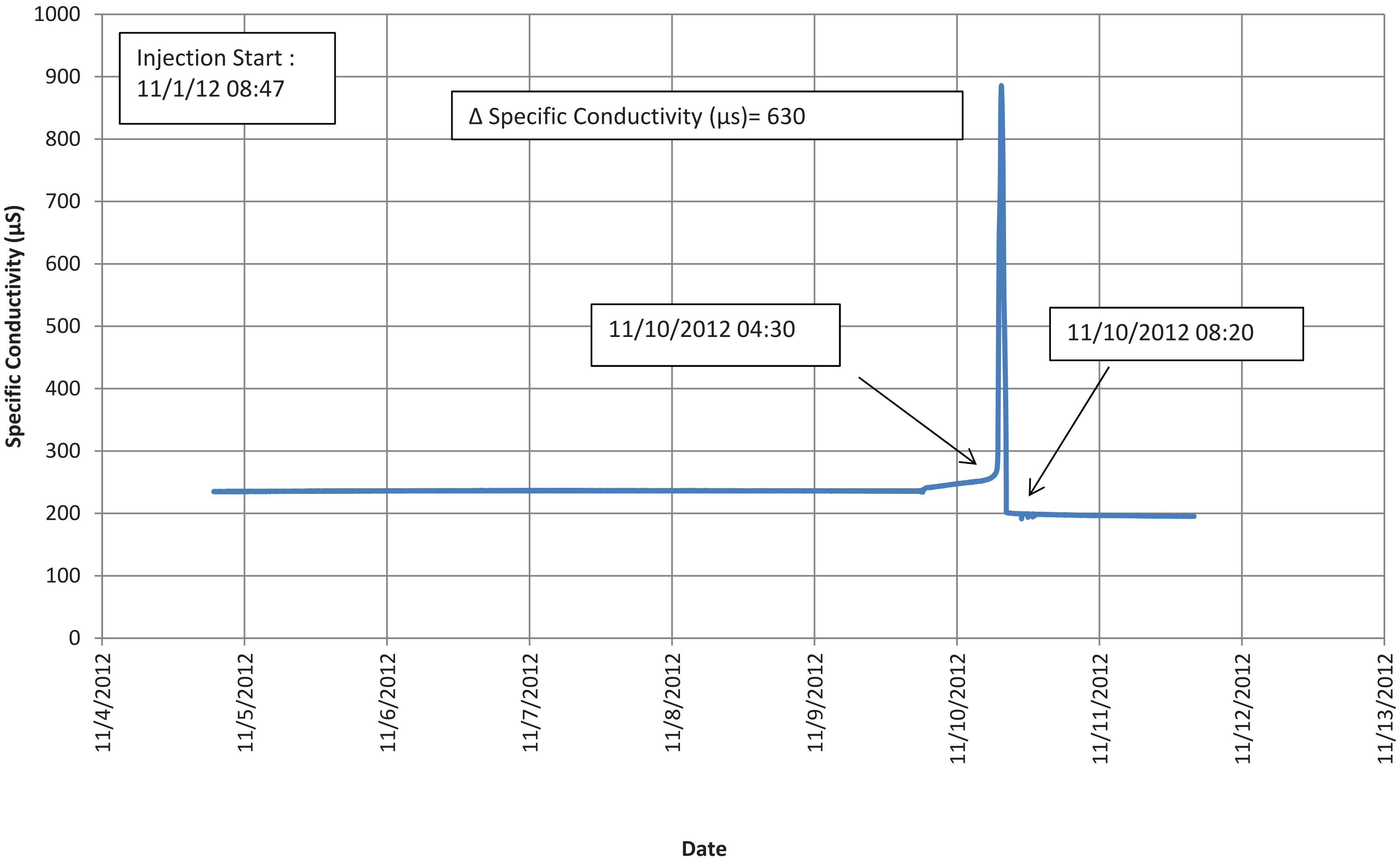
Graph I-13

Results of the Tracer Test for Observation Well OW15E



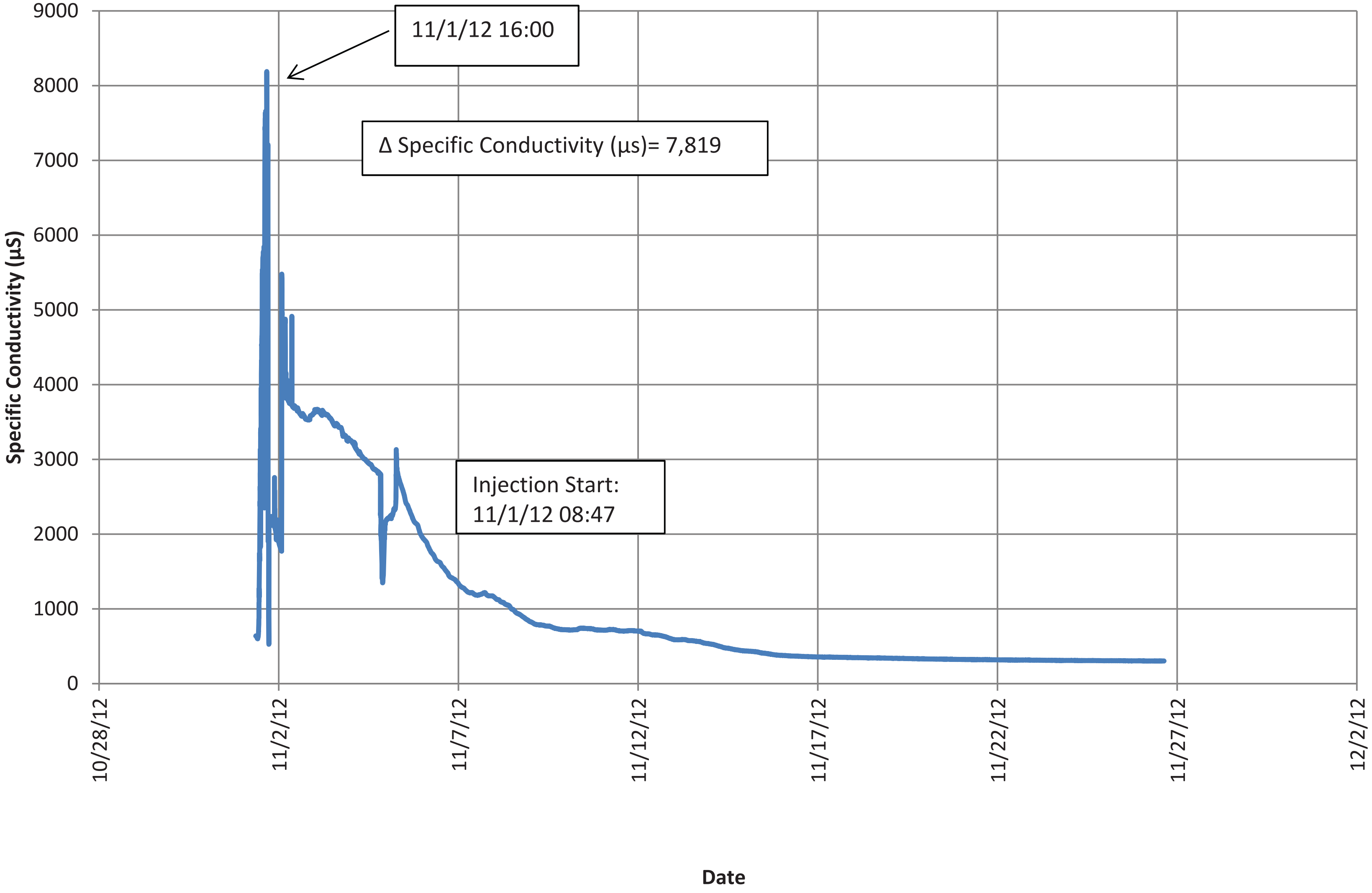
Graph I-14

Results of the Tracer Test for Observation Well OW25E



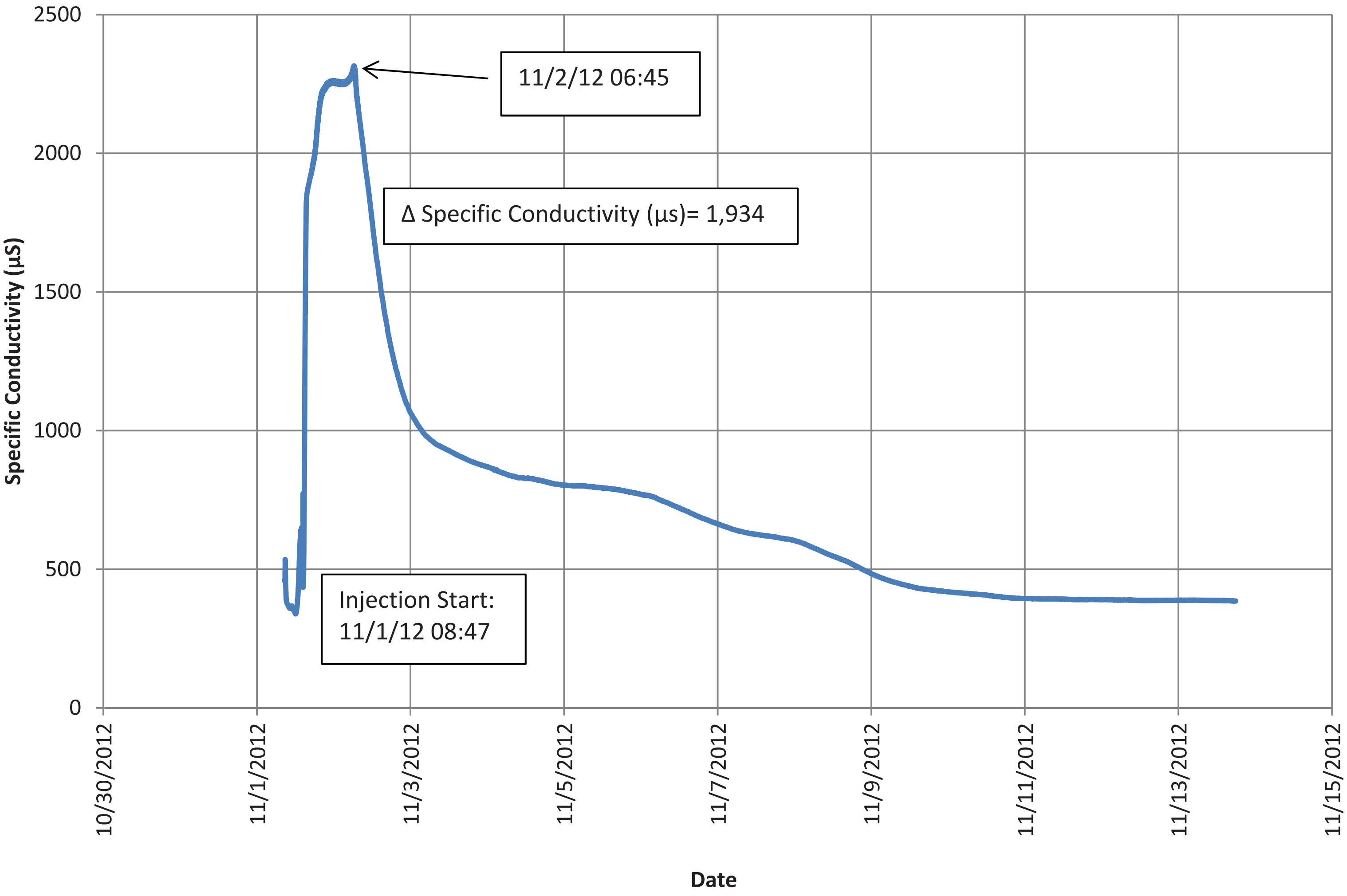
Graph I-15

Results of the Tracer Test for Observation Well OW3N



Graph I-16

Results of the Tracer Test for Observation Well OW6N



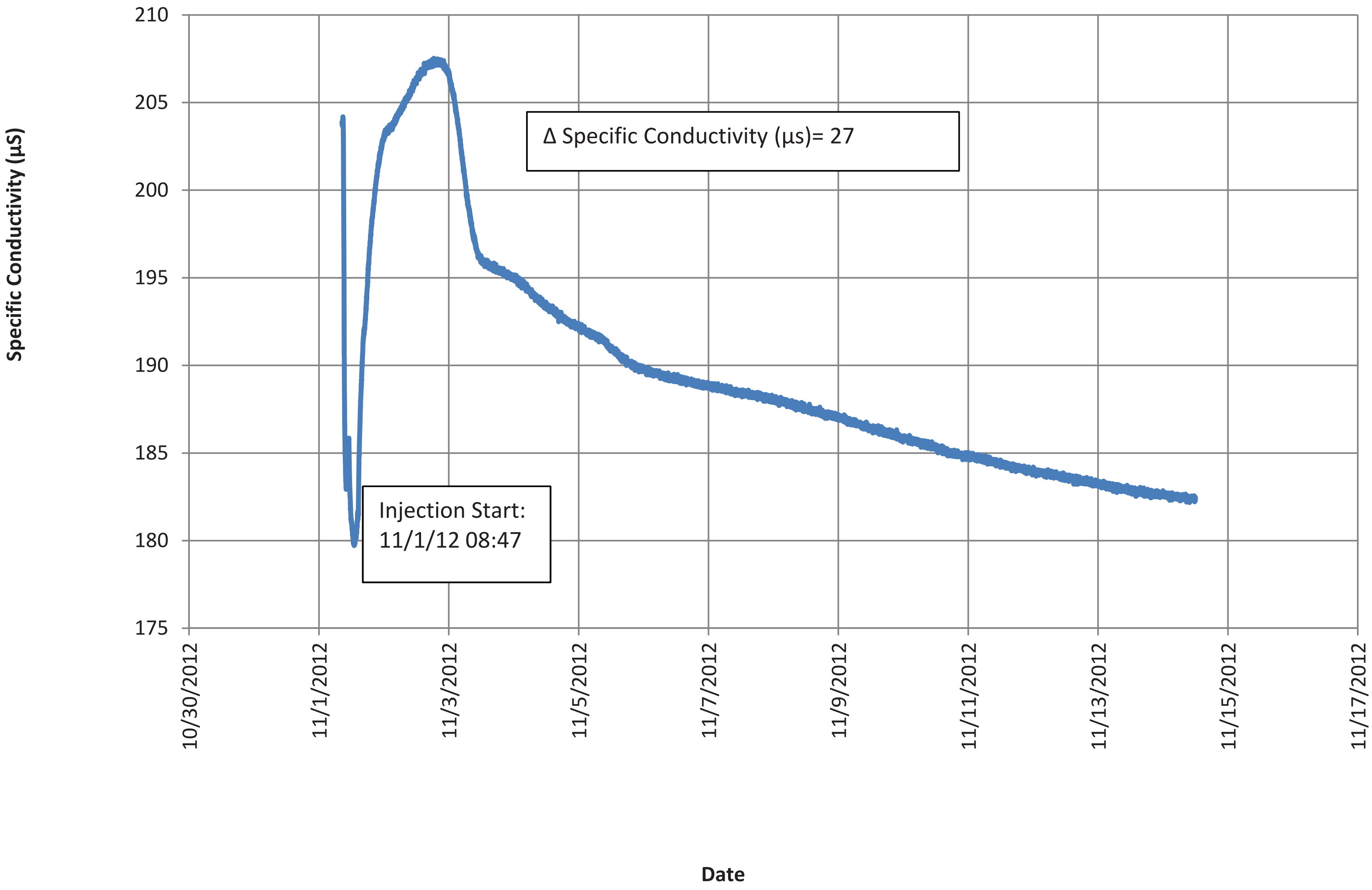
11/2/12 06:45

Δ Specific Conductivity (µs)= 1,934

Injection Start:
11/1/12 08:47

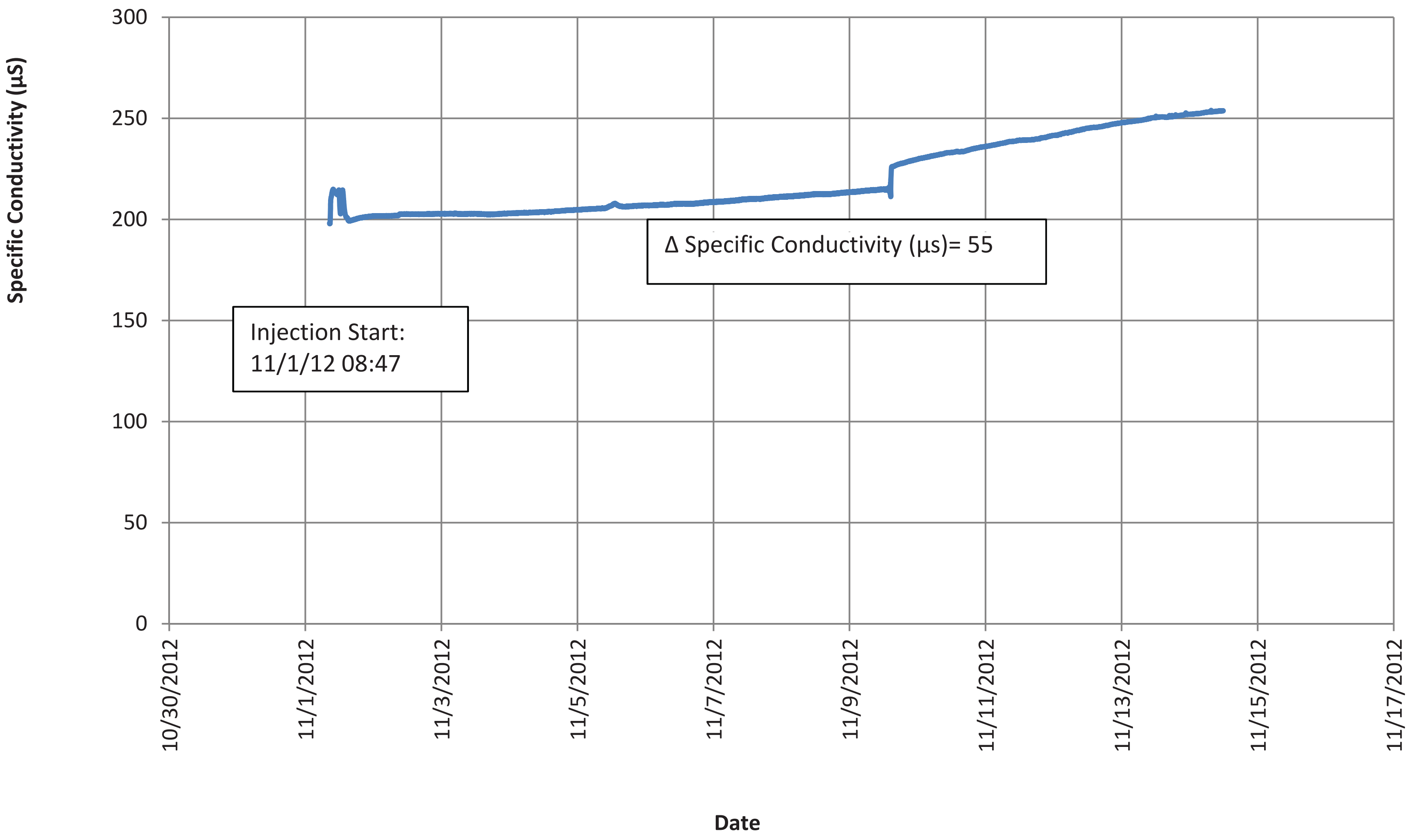
Graph I-17

Results of the Tracer Test for Observation Well OW15N



Graph I-18

Results of the Tracer Test for Observation Well OW25N



Graph I-19

APPENDIX J

VAPOR ANALYTICAL REPORT

07-Jan-2013

Paul Stork
AMEC Environment & Infrastructure
521 Byers Road; Suite 204
Miamisburg, OH 45342

Tel: 937-859-3600
Fax: 937-859-7951

Re: Textron TFS; 3359122618.06.01 Work Order: **1212459**

Dear Paul,

ALS Environmental received 2 samples on 19-Dec-2012 12:51 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 18.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Mark Johnson

Electronically approved by: Leah Krazl

Mark Johnson
Project manager

Client: AMEC Environment & Infrastructure
Project: Textron TFS; 3359122618.06.01
Work Order: 1212459

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: 07-Jan-13

Client: AMEC Environment & Infrastructure
Project: Textron TFS; 3359122618.06.01
Work Order: **1212459**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1212459-01	ATR-TEMPEW-1A-V121812	Air		12/18/2012 10:50	12/19/2012 12:51	☐
1212459-02	ATR-TEMPEW-1B-V121812	Air		12/18/2012 14:20	12/19/2012 12:51	☐

ALS Environmental

Date: *07-Jan-13*

Client:	AMEC Environment & Infrastructure		
Project:	Textron TFS; 3359122618.06.01	**Work Order:**	1212459
Sample ID:	ATR-TEMPEW-1A-V121812	**Lab ID:**	1212459-01
Collection Date:	12/18/2012 10:50 AM	**Matrix:**	AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,1,2,2-Tetrachloroethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,1,2-Trichloroethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,1-Dichloroethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,1-Dichloroethene	**290**	E	**5.0**	**ppbv**	10	12/28/2012 04:16 AM
1,2,4-Trichlorobenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,2,4-Trimethylbenzene	**50**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
1,2-Dibromoethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,2-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,2-Dichloroethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,2-Dichloropropane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,3,5-Trimethylbenzene	**18**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
1,3-Butadiene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,3-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,4-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
1,4-Dioxane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
2-Butanone	**190**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
2-Hexanone	ND		5.0	ppbv	10	12/28/2012 04:16 AM
2-Propanol	ND		10	ppbv	10	12/28/2012 04:16 AM
4-Ethyltoluene	**8.7**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
4-Methyl-2-pentanone	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Acetone	**190**		**10**	**ppbv**	10	12/28/2012 04:16 AM
Benzene	**7.5**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Benzyl chloride	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Bromodichloromethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Bromoform	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Bromomethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Carbon disulfide	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Carbon tetrachloride	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Chlorobenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Chloroethane	**7.9**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Chloroform	**42**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Chloromethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
cis-1,2-Dichloroethene	**47,000**		**2,000**	**ppbv**	4000	1/3/2013 11:37 AM
cis-1,3-Dichloropropene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Cumene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Cyclohexane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Dibromochloromethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Dichlorodifluoromethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client:	AMEC Environment & Infrastructure		
Project:	Textron TFS; 3359122618.06.01	**Work Order:**	1212459
Sample ID:	ATR-TEMPEW-1A-V121812	**Lab ID:**	1212459-01
Collection Date:	12/18/2012 10:50 AM	**Matrix:**	AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Ethylbenzene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Freon 113	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Freon 114	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Heptane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Hexachlorobutadiene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Hexane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
m,p-Xylene	**18**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Methylene chloride	ND		5.0	ppbv	10	12/28/2012 04:16 AM
MTBE	ND		5.0	ppbv	10	12/28/2012 04:16 AM
o-Xylene	**16**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Propene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Styrene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Tetrachloroethene	**680**	E	**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Tetrahydrofuran	**270**	E	**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Toluene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
trans-1,2-Dichloroethene	**440**	E	**5.0**	**ppbv**	10	12/28/2012 04:16 AM
trans-1,3-Dichloropropene	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Trichloroethene	**9,000**		**800**	**ppbv**	4000	1/3/2013 11:37 AM
Trichlorofluoromethane	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Vinyl acetate	ND		5.0	ppbv	10	12/28/2012 04:16 AM
Vinyl chloride	**84**		**5.0**	**ppbv**	10	12/28/2012 04:16 AM
Surr: Bromofluorobenzene	*93.8*		*60-140*	*%REC*	10	12/28/2012 04:16 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		27	µg/m3	10	12/28/2012 04:16 AM
1,1,2,2-Tetrachloroethane	ND		34	µg/m3	10	12/28/2012 04:16 AM
1,1,2-Trichloroethane	ND		27	µg/m3	10	12/28/2012 04:16 AM
1,1-Dichloroethane	ND		20	µg/m3	10	12/28/2012 04:16 AM
1,1-Dichloroethene	**1,100**	E	**20**	**µg/m3**	10	12/28/2012 04:16 AM
1,2,4-Trichlorobenzene	ND		37	µg/m3	10	12/28/2012 04:16 AM
1,2,4-Trimethylbenzene	**250**		**25**	**µg/m3**	10	12/28/2012 04:16 AM
1,2-Dibromoethane	ND		38	µg/m3	10	12/28/2012 04:16 AM
1,2-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 04:16 AM
1,2-Dichloroethane	ND		20	µg/m3	10	12/28/2012 04:16 AM
1,2-Dichloropropane	ND		23	µg/m3	10	12/28/2012 04:16 AM
1,3,5-Trimethylbenzene	**90**		**25**	**µg/m3**	10	12/28/2012 04:16 AM
1,3-Butadiene	ND		11	µg/m3	10	12/28/2012 04:16 AM
1,3-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 04:16 AM
1,4-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 04:16 AM
1,4-Dioxane	ND		18	µg/m3	10	12/28/2012 04:16 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client: AMEC Environment & Infrastructure

Project: Textron TFS; 3359122618.06.01

Work Order: 1212459

Sample ID: ATR-TEMPEW-1A-V121812

Lab ID: 1212459-01

Collection Date: 12/18/2012 10:50 AM

Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Butanone	**550**		**15**	**µg/m3**	10	12/28/2012 04:16 AM
2-Hexanone	ND		20	µg/m3	10	12/28/2012 04:16 AM
2-Propanol	ND		25	µg/m3	10	12/28/2012 04:16 AM
4-Ethyltoluene	**43**		**25**	**µg/m3**	10	12/28/2012 04:16 AM
4-Methyl-2-pentanone	ND		20	µg/m3	10	12/28/2012 04:16 AM
Acetone	**440**		**24**	**µg/m3**	10	12/28/2012 04:16 AM
Benzene	**24**		**16**	**µg/m3**	10	12/28/2012 04:16 AM
Benzyl chloride	ND		26	µg/m3	10	12/28/2012 04:16 AM
Bromodichloromethane	ND		34	µg/m3	10	12/28/2012 04:16 AM
Bromoform	ND		52	µg/m3	10	12/28/2012 04:16 AM
Bromomethane	ND		19	µg/m3	10	12/28/2012 04:16 AM
Carbon disulfide	ND		16	µg/m3	10	12/28/2012 04:16 AM
Carbon tetrachloride	ND		31	µg/m3	10	12/28/2012 04:16 AM
Chlorobenzene	ND		23	µg/m3	10	12/28/2012 04:16 AM
Chloroethane	**21**		**13**	**µg/m3**	10	12/28/2012 04:16 AM
Chloroform	**210**		**24**	**µg/m3**	10	12/28/2012 04:16 AM
Chloromethane	ND		10	µg/m3	10	12/28/2012 04:16 AM
cis-1,2-Dichloroethene	**190,000**		**7,900**	**µg/m3**	4000	1/3/2013 11:37 AM
cis-1,3-Dichloropropene	ND		23	µg/m3	10	12/28/2012 04:16 AM
Cumene	ND		25	µg/m3	10	12/28/2012 04:16 AM
Cyclohexane	ND		17	µg/m3	10	12/28/2012 04:16 AM
Dibromochloromethane	ND		43	µg/m3	10	12/28/2012 04:16 AM
Dichlorodifluoromethane	ND		25	µg/m3	10	12/28/2012 04:16 AM
Ethyl acetate	ND		18	µg/m3	10	12/28/2012 04:16 AM
Ethylbenzene	ND		22	µg/m3	10	12/28/2012 04:16 AM
Freon 113	ND		38	µg/m3	10	12/28/2012 04:16 AM
Freon 114	ND		35	µg/m3	10	12/28/2012 04:16 AM
Heptane	ND		20	µg/m3	10	12/28/2012 04:16 AM
Hexachlorobutadiene	ND		53	µg/m3	10	12/28/2012 04:16 AM
Hexane	ND		18	µg/m3	10	12/28/2012 04:16 AM
m,p-Xylene	**77**		**22**	**µg/m3**	10	12/28/2012 04:16 AM
Methylene chloride	ND		17	µg/m3	10	12/28/2012 04:16 AM
MTBE	ND		18	µg/m3	10	12/28/2012 04:16 AM
o-Xylene	**70**		**22**	**µg/m3**	10	12/28/2012 04:16 AM
Propene	ND		8.6	µg/m3	10	12/28/2012 04:16 AM
Styrene	ND		21	µg/m3	10	12/28/2012 04:16 AM
Tetrachloroethene	**4,600**	E	**34**	**µg/m3**	10	12/28/2012 04:16 AM
Tetrahydrofuran	**790**	E	**15**	**µg/m3**	10	12/28/2012 04:16 AM
Toluene	ND		19	µg/m3	10	12/28/2012 04:16 AM
trans-1,2-Dichloroethene	**1,800**	E	**20**	**µg/m3**	10	12/28/2012 04:16 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client: AMEC Environment & Infrastructure
Project: Textron TFS; 3359122618.06.01
Work Order: 1212459
Sample ID: ATR-TEMPEW-1A-V121812
Lab ID: 1212459-01
Collection Date: 12/18/2012 10:50 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
trans-1,3-Dichloropropene	ND		23	µg/m3	10	12/28/2012 04:16 AM
Trichloroethene	**48,000**		**4,300**	**µg/m3**	4000	1/3/2013 11:37 AM
Trichlorofluoromethane	ND		28	µg/m3	10	12/28/2012 04:16 AM
Vinyl acetate	ND		18	µg/m3	10	12/28/2012 04:16 AM
Vinyl chloride	**210**		**13**	**µg/m3**	10	12/28/2012 04:16 AM
Surr: Bromofluorobenzene	*93.8*		*60-140*	*%REC*	10	12/28/2012 04:16 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client:	AMEC Environment & Infrastructure		
Project:	Textron TFS; 3359122618.06.01	**Work Order:**	1212459
Sample ID:	ATR-TEMPEW-1B-V121812	**Lab ID:**	1212459-02
Collection Date:	12/18/2012 02:20 PM	**Matrix:**	AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,1,2,2-Tetrachloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,1,2-Trichloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,1-Dichloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,1-Dichloroethene	**270**	E	**5.0**	**ppbv**	10	12/28/2012 05:00 AM
1,2,4-Trichlorobenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,2,4-Trimethylbenzene	**20**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
1,2-Dibromoethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,2-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,2-Dichloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,2-Dichloropropane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,3,5-Trimethylbenzene	**7.2**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
1,3-Butadiene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,3-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,4-Dichlorobenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
1,4-Dioxane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
2-Butanone	**39**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
2-Hexanone	ND		5.0	ppbv	10	12/28/2012 05:00 AM
2-Propanol	ND		10	ppbv	10	12/28/2012 05:00 AM
4-Ethyltoluene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
4-Methyl-2-pentanone	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Acetone	**30**		**10**	**ppbv**	10	12/28/2012 05:00 AM
Benzene	**6.0**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
Benzyl chloride	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Bromodichloromethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Bromoform	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Bromomethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Carbon disulfide	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Carbon tetrachloride	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Chlorobenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Chloroethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Chloroform	**35**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
Chloromethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
cis-1,2-Dichloroethene	**38,000**		**2,000**	**ppbv**	4000	1/3/2013 01:18 PM
cis-1,3-Dichloropropene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Cumene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Cyclohexane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Dibromochloromethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Dichlorodifluoromethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client:	AMEC Environment & Infrastructure		
Project:	Textron TFS; 3359122618.06.01	**Work Order:**	1212459
Sample ID:	ATR-TEMPEW-1B-V121812	**Lab ID:**	1212459-02
Collection Date:	12/18/2012 02:20 PM	**Matrix:**	AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Ethylbenzene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Freon 113	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Freon 114	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Heptane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Hexachlorobutadiene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Hexane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
m,p-Xylene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Methylene chloride	ND		5.0	ppbv	10	12/28/2012 05:00 AM
MTBE	ND		5.0	ppbv	10	12/28/2012 05:00 AM
o-Xylene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Propene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Styrene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Tetrachloroethene	**560**	E	**5.0**	**ppbv**	10	12/28/2012 05:00 AM
Tetrahydrofuran	**49**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
Toluene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
trans-1,2-Dichloroethene	**380**	E	**5.0**	**ppbv**	10	12/28/2012 05:00 AM
trans-1,3-Dichloropropene	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Trichloroethene	**7,600**		**800**	**ppbv**	4000	1/3/2013 01:18 PM
Trichlorofluoromethane	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Vinyl acetate	ND		5.0	ppbv	10	12/28/2012 05:00 AM
Vinyl chloride	**90**		**5.0**	**ppbv**	10	12/28/2012 05:00 AM
Surr: Bromofluorobenzene	*92.5*		*60-140*	*%REC*	10	12/28/2012 05:00 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		27	µg/m3	10	12/28/2012 05:00 AM
1,1,2,2-Tetrachloroethane	ND		34	µg/m3	10	12/28/2012 05:00 AM
1,1,2-Trichloroethane	ND		27	µg/m3	10	12/28/2012 05:00 AM
1,1-Dichloroethane	ND		20	µg/m3	10	12/28/2012 05:00 AM
1,1-Dichloroethene	**1,100**	E	**20**	**µg/m3**	10	12/28/2012 05:00 AM
1,2,4-Trichlorobenzene	ND		37	µg/m3	10	12/28/2012 05:00 AM
1,2,4-Trimethylbenzene	**100**		**25**	**µg/m3**	10	12/28/2012 05:00 AM
1,2-Dibromoethane	ND		38	µg/m3	10	12/28/2012 05:00 AM
1,2-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 05:00 AM
1,2-Dichloroethane	ND		20	µg/m3	10	12/28/2012 05:00 AM
1,2-Dichloropropane	ND		23	µg/m3	10	12/28/2012 05:00 AM
1,3,5-Trimethylbenzene	**35**		**25**	**µg/m3**	10	12/28/2012 05:00 AM
1,3-Butadiene	ND		11	µg/m3	10	12/28/2012 05:00 AM
1,3-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 05:00 AM
1,4-Dichlorobenzene	ND		30	µg/m3	10	12/28/2012 05:00 AM
1,4-Dioxane	ND		18	µg/m3	10	12/28/2012 05:00 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client:	AMEC Environment & Infrastructure		
Project:	Textron TFS; 3359122618.06.01	**Work Order:**	1212459
Sample ID:	ATR-TEMPEW-1B-V121812	**Lab ID:**	1212459-02
Collection Date:	12/18/2012 02:20 PM	**Matrix:**	AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Butanone	**110**		**15**	**µg/m3**	10	12/28/2012 05:00 AM
2-Hexanone	ND		20	µg/m3	10	12/28/2012 05:00 AM
2-Propanol	ND		25	µg/m3	10	12/28/2012 05:00 AM
4-Ethyltoluene	ND		25	µg/m3	10	12/28/2012 05:00 AM
4-Methyl-2-pentanone	ND		20	µg/m3	10	12/28/2012 05:00 AM
Acetone	**71**		**24**	**µg/m3**	10	12/28/2012 05:00 AM
Benzene	**19**		**16**	**µg/m3**	10	12/28/2012 05:00 AM
Benzyl chloride	ND		26	µg/m3	10	12/28/2012 05:00 AM
Bromodichloromethane	ND		34	µg/m3	10	12/28/2012 05:00 AM
Bromoform	ND		52	µg/m3	10	12/28/2012 05:00 AM
Bromomethane	ND		19	µg/m3	10	12/28/2012 05:00 AM
Carbon disulfide	ND		16	µg/m3	10	12/28/2012 05:00 AM
Carbon tetrachloride	ND		31	µg/m3	10	12/28/2012 05:00 AM
Chlorobenzene	ND		23	µg/m3	10	12/28/2012 05:00 AM
Chloroethane	ND		13	µg/m3	10	12/28/2012 05:00 AM
Chloroform	**170**		**24**	**µg/m3**	10	12/28/2012 05:00 AM
Chloromethane	ND		10	µg/m3	10	12/28/2012 05:00 AM
cis-1,2-Dichloroethene	**150,000**		**7,900**	**µg/m3**	4000	1/3/2013 01:18 PM
cis-1,3-Dichloropropene	ND		23	µg/m3	10	12/28/2012 05:00 AM
Cumene	ND		25	µg/m3	10	12/28/2012 05:00 AM
Cyclohexane	ND		17	µg/m3	10	12/28/2012 05:00 AM
Dibromochloromethane	ND		43	µg/m3	10	12/28/2012 05:00 AM
Dichlorodifluoromethane	ND		25	µg/m3	10	12/28/2012 05:00 AM
Ethyl acetate	ND		18	µg/m3	10	12/28/2012 05:00 AM
Ethylbenzene	ND		22	µg/m3	10	12/28/2012 05:00 AM
Freon 113	ND		38	µg/m3	10	12/28/2012 05:00 AM
Freon 114	ND		35	µg/m3	10	12/28/2012 05:00 AM
Heptane	ND		20	µg/m3	10	12/28/2012 05:00 AM
Hexachlorobutadiene	ND		53	µg/m3	10	12/28/2012 05:00 AM
Hexane	ND		18	µg/m3	10	12/28/2012 05:00 AM
m,p-Xylene	ND		22	µg/m3	10	12/28/2012 05:00 AM
Methylene chloride	ND		17	µg/m3	10	12/28/2012 05:00 AM
MTBE	ND		18	µg/m3	10	12/28/2012 05:00 AM
o-Xylene	ND		22	µg/m3	10	12/28/2012 05:00 AM
Propene	ND		8.6	µg/m3	10	12/28/2012 05:00 AM
Styrene	ND		21	µg/m3	10	12/28/2012 05:00 AM
Tetrachloroethene	**3,800**	E	**34**	**µg/m3**	10	12/28/2012 05:00 AM
Tetrahydrofuran	**140**		**15**	**µg/m3**	10	12/28/2012 05:00 AM
Toluene	ND		19	µg/m3	10	12/28/2012 05:00 AM
trans-1,2-Dichloroethene	**1,500**	E	**20**	**µg/m3**	10	12/28/2012 05:00 AM

Note:

ALS Environmental

Date: *07-Jan-13*

Client: AMEC Environment & Infrastructure

Project: Textron TFS; 3359122618.06.01 **Work Order:** 1212459

Sample ID: ATR-TEMPEW-1B-V121812 **Lab ID:** 1212459-02

Collection Date: 12/18/2012 02:20 PM **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
trans-1,3-Dichloropropene	ND		23	µg/m3	10	12/28/2012 05:00 AM
Trichloroethene	**41,000**		**4,300**	**µg/m3**	4000	1/3/2013 01:18 PM
Trichlorofluoromethane	ND		28	µg/m3	10	12/28/2012 05:00 AM
Vinyl acetate	ND		18	µg/m3	10	12/28/2012 05:00 AM
Vinyl chloride	**230**		**13**	**µg/m3**	10	12/28/2012 05:00 AM
Surr: Bromofluorobenzene	*92.5*		*60-140*	*%REC*	10	12/28/2012 05:00 AM

Note:

ALS Environmental

Date: 07-Jan-13

Client: AMEC Environment & Infrastructure
Work Order: 1212459
Project: Textron TFS; 3359122618.06.01

QC BATCH REPORT

Batch ID: **R96103** Instrument ID **VMS3** Method: **ETO-15**

MBLK Sample ID: **mblk-R96103** Units: **ppbv** Analysis Date: **12/27/2012 01:29 PM**

Client ID: Run ID: **VMS3_121227A** SeqNo: **549375** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.50								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2,4-Trichlorobenzene	ND	0.50								
1,2,4-Trimethylbenzene	ND	0.50								
1,2-Dibromoethane	ND	0.50								
1,2-Dichlorobenzene	ND	0.50								
1,2-Dichloroethane	ND	0.50								
1,2-Dichloropropane	ND	0.50								
1,3,5-Trimethylbenzene	ND	0.50								
1,3-Butadiene	ND	0.50								
1,3-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.50								
1,4-Dioxane	ND	0.50								
2-Butanone	ND	0.50								
2-Hexanone	ND	0.50								
2-Propanol	ND	1.0								
4-Ethyltoluene	ND	0.50								
4-Methyl-2-pentanone	ND	0.50								
Acetone	ND	1.0								
Benzene	ND	0.50								
Benzyl chloride	ND	0.50								
Bromodichloromethane	ND	0.50								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.50								
Chloromethane	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
Cumene	ND	0.50								
Cyclohexane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
Ethyl acetate	ND	0.50								
Ethylbenzene	ND	0.50								
Freon 113	ND	0.50								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R96103** Instrument ID **VMS3** Method: **ETO-15**

Freon 114	ND	0.50					
Heptane	ND	0.50					
Hexachlorobutadiene	ND	0.50					
Hexane	ND	0.50					
m,p-Xylene	ND	0.50					
Methylene chloride	ND	0.50					
MTBE	ND	0.50					
o-Xylene	ND	0.50					
Propene	ND	0.50					
Styrene	ND	0.50					
Tetrachloroethene	ND	0.50					
Tetrahydrofuran	ND	0.50					
Toluene	ND	0.50					
trans-1,2-Dichloroethene	ND	0.50					
trans-1,3-Dichloropropene	ND	0.50					
Trichlorofluoromethane	ND	0.50					
Vinyl acetate	ND	0.50					
Vinyl chloride	ND	0.50					
Surr: Bromofluorobenzene	*9.6*	0	*10*	0	*96*	*60-140*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: AMEC Environment & Infrastructure
Work Order: 1212459
Project: Textron TFS; 3359122618.06.01

QC BATCH REPORT

Batch ID: **R96103** Instrument ID **VMS3** Method: **ETO-15**

LCS Sample ID: **LCS-R96103** Units: **ppbv** Analysis Date: **12/27/2012 09:09 AM**
Client ID: Run ID: **VMS3_121227A** SeqNo: **549374** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	9.69	0.50	10	0	96.9	60-140	0			
1,1,2,2-Tetrachloroethane	10.51	0.50	10	0	105	60-140	0			
1,1,2-Trichloroethane	9.59	0.50	10	0	95.9	60-140	0			
1,1-Dichloroethane	8.75	0.50	10	0	87.5	60-140	0			
1,1-Dichloroethene	8.93	0.50	10	0	89.3	60-140	0			
1,2,4-Trichlorobenzene	10.7	0.50	10	0	107	60-140	0			
1,2,4-Trimethylbenzene	11.33	0.50	10	0	113	60-140	0			
1,2-Dibromoethane	10.15	0.50	10	0	102	60-140	0			
1,2-Dichlorobenzene	10.98	0.50	10	0	110	60-140	0			
1,2-Dichloroethane	8.93	0.50	10	0	89.3	60-140	0			
1,2-Dichloropropane	9.1	0.50	10	0	91	60-140	0			
1,3,5-Trimethylbenzene	11.31	0.50	10	0	113	60-140	0			
1,3-Butadiene	8.22	0.50	10	0	82.2	60-140	0			
1,3-Dichlorobenzene	10.99	0.50	10	0	110	60-140	0			
1,4-Dichlorobenzene	10.89	0.50	10	0	109	60-140	0			
1,4-Dioxane	10.46	0.50	10	0	105	60-140	0			
2-Butanone	9.28	0.50	10	0	92.8	60-140	0			
2-Hexanone	10.28	0.50	10	0	103	60-140	0			
2-Propanol	8.76	1.0	10	0	87.6	60-140	0			
4-Ethyltoluene	11.13	0.50	10	0	111	60-140	0			
4-Methyl-2-pentanone	9.93	0.50	10	0	99.3	60-140	0			
Acetone	8.27	1.0	10	0	82.7	60-140	0			
Benzene	8.88	0.50	10	0	88.8	60-140	0			
Benzyl chloride	13.32	0.50	10	0	133	60-140	0			
Bromodichloromethane	10.46	0.50	10	0	105	60-140	0			
Bromoform	12.86	0.50	10	0	129	60-140	0			
Bromomethane	8.7	0.50	10	0	87	60-140	0			
Carbon disulfide	9.01	0.50	10	0	90.1	60-140	0			
Carbon tetrachloride	10.27	0.50	10	0	103	60-140	0			
Chlorobenzene	10.62	0.50	10	0	106	60-140	0			
Chloroethane	8.66	0.50	10	0	86.6	60-140	0			
Chloroform	9.12	0.50	10	0	91.2	60-140	0			
Chloromethane	7.98	0.50	10	0	79.8	60-140	0			
cis-1,3-Dichloropropene	10.35	0.50	10	0	104	60-140	0			
Cumene	10.95	0.50	10	0	110	60-140	0			
Cyclohexane	9.13	0.50	10	0	91.3	60-140	0			
Dibromochloromethane	11.11	0.50	10	0	111	60-140	0			
Dichlorodifluoromethane	8.74	0.50	10	0	87.4	60-140	0			
Ethyl acetate	9.44	0.50	10	0	94.4	60-140	0			
Ethylbenzene	10.72	0.50	10	0	107	60-140	0			
Freon 113	9.25	0.50	10	0	92.5	60-140	0			
Freon 114	8.91	0.50	10	0	89.1	60-140	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R96103** Instrument ID **VMS3** Method: **ETO-15**

Heptane	8.53	0.50	10	0	85.3	60-140	0
Hexachlorobutadiene	10.95	0.50	10	0	110	60-140	0
Hexane	8.51	0.50	10	0	85.1	60-140	0
m,p-Xylene	23.89	0.50	20	0	119	60-140	0
Methylene chloride	8.32	0.50	10	0	83.2	60-140	0
MTBE	9.62	0.50	10	0	96.2	60-140	0
o-Xylene	10.86	0.50	10	0	109	60-140	0
Propene	7.24	0.50	10	0	72.4	60-140	0
Styrene	11.16	0.50	10	0	112	60-140	0
Tetrachloroethene	10.48	0.50	10	0	105	60-140	0
Tetrahydrofuran	8.86	0.50	10	0	88.6	60-140	0
Toluene	10.04	0.50	10	0	100	60-140	0
trans-1,2-Dichloroethene	9.19	0.50	10	0	91.9	60-140	0
trans-1,3-Dichloropropene	10.85	0.50	10	0	108	60-140	0
Trichlorofluoromethane	9.36	0.50	10	0	93.6	60-140	0
Vinyl acetate	8.3	0.50	10	0	83	60-140	0
Vinyl chloride	8.52	0.50	10	0	85.2	60-140	0
Surr: Bromofluorobenzene	*9.75*	0	*10*	0	*97.5*	*60-140*	0

The following samples were analyzed in this batch: 1212459-01A 1212459-02A

Client: AMEC Environment & Infrastructure
Work Order: 1212459
Project: Textron TFS; 3359122618.06.01

QC BATCH REPORT

Batch ID: **R96216** Instrument ID **VMS3** Method: **ETO-15**

MBLK Sample ID: **mblk-R96216** Units: **ppbv** Analysis Date: **1/3/2013 09:54 AM**

Client ID: Run ID: **VMS3_130103A** SeqNo: **551249** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	ND	0.50								
Trichloroethene	ND	0.20								
Surr: Bromofluorobenzene	*9.46*	0	*10*	0	*94.6*	*60-140*	0			

LCS Sample ID: **LCS-R96216** Units: **ppbv** Analysis Date: **1/3/2013 09:04 AM**

Client ID: Run ID: **VMS3_130103A** SeqNo: **551248** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	10.25	0.50	10	0	102	60-140	0			
Trichloroethene	10.04	0.20	10	0	100	60-140	0			
Surr: Bromofluorobenzene	*10.08*	0	*10*	0	*101*	*60-140*	0			

The following samples were analyzed in this batch: 1212459-01A 1212459-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 07-Jan-13

Client: AMEC Environment & Infrastructure
Project: Textron TFS; 3359122618.06.01
WorkOrder: **1212459**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/m3	
ppbv	

ALS Environmental

Sample Receipt Checklist

Client Name: **AMEC-MIAMISBURG**

Date/Time Received: **19-Dec-12 12:51**

Work Order: **1212459**

Received by: **SJW**

Checklist completed by Steve Wilcox (eSignature) 20-Dec-12 (Date)

Reviewed by: Jim Baxter (eSignature) 20-Dec-12 (Date)

Matrices:

Carrier name: Client

Shipping container/cooler in good condition?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

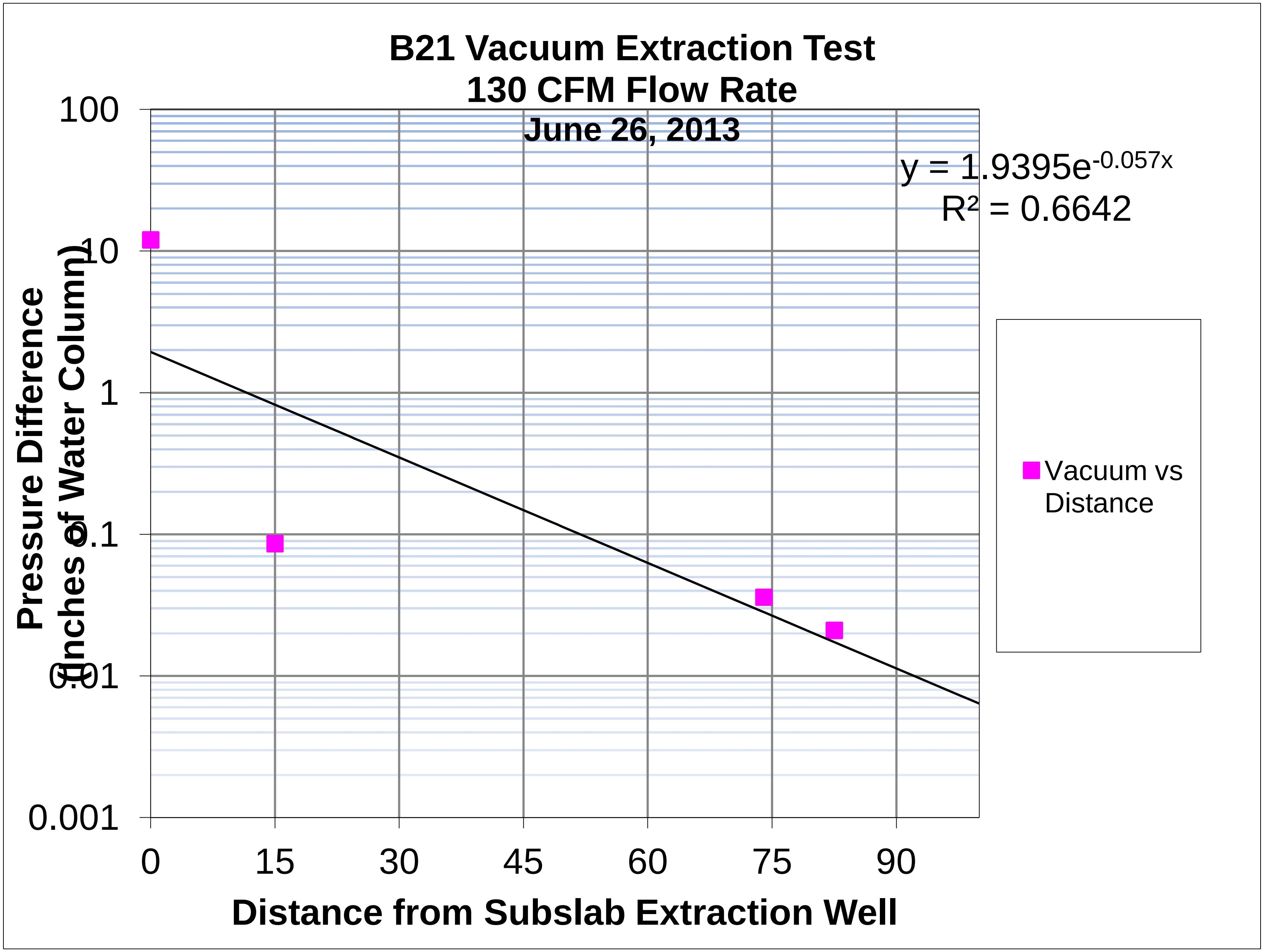
Regarding:

Comments:

CorrectiveAction:

APPENDIX K

GRAPHS OF VACUUM RADIUS OF INFLUENCE FROM SSD PILOT TEST



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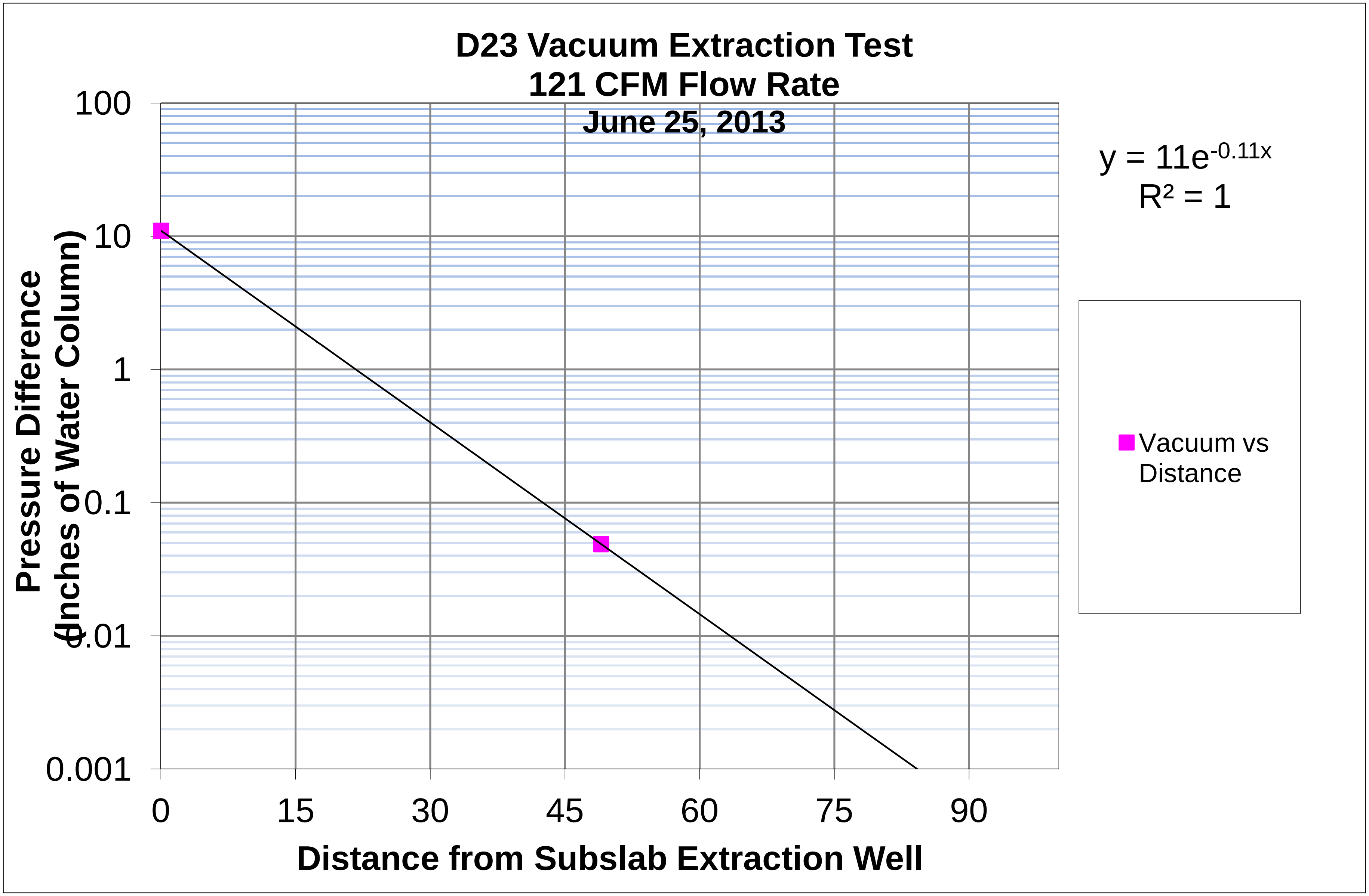
Checked By: .



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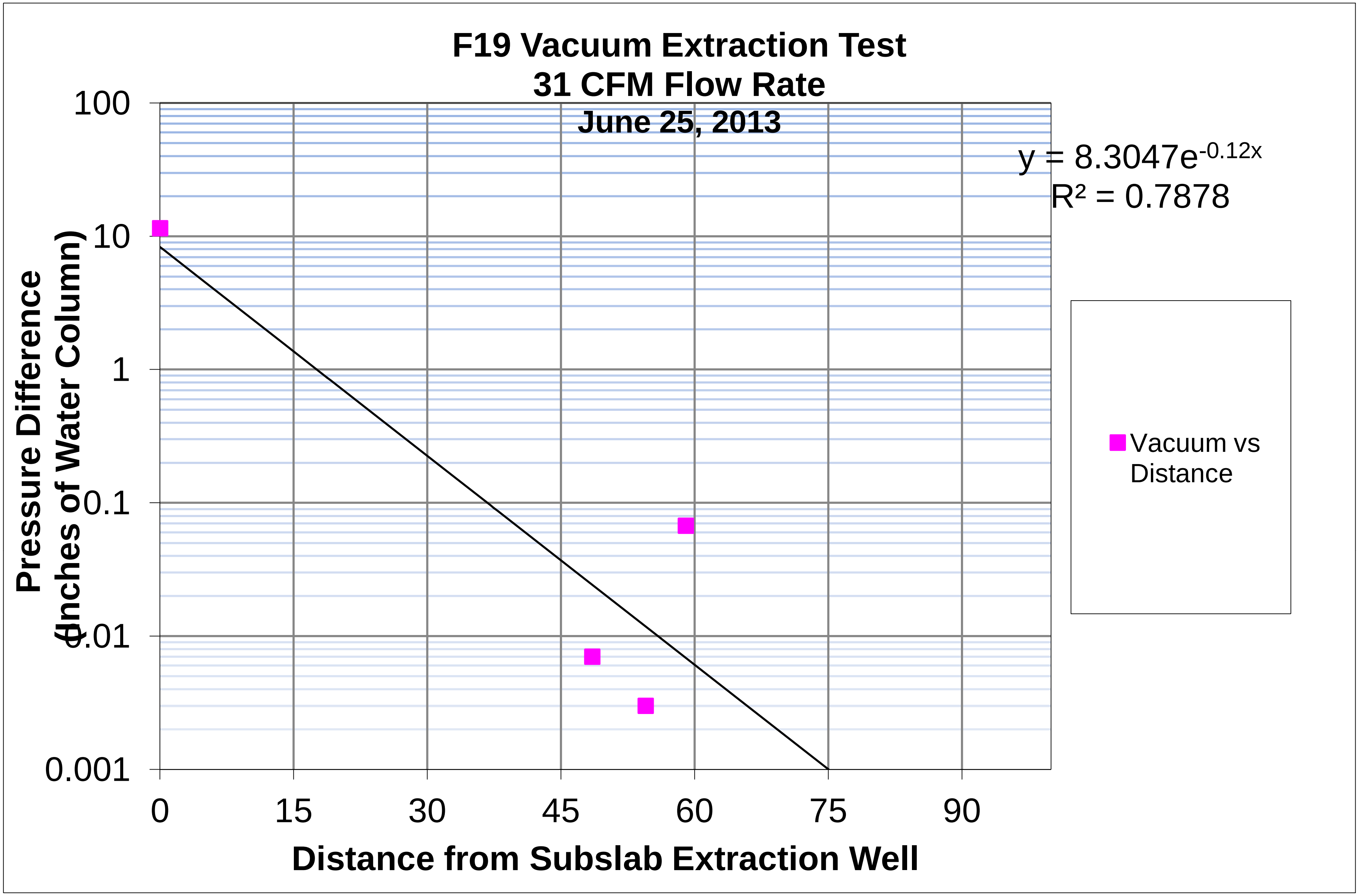

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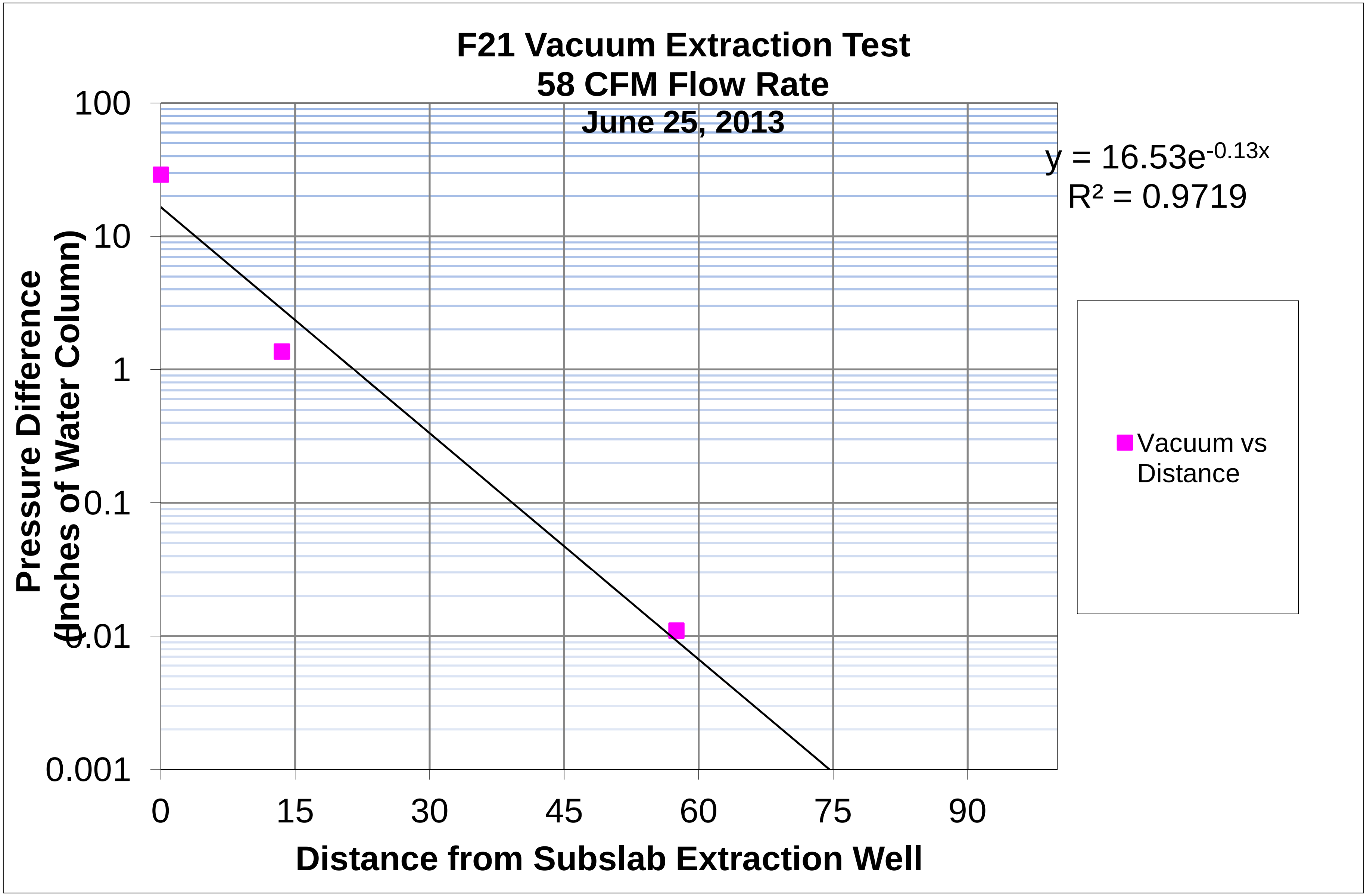
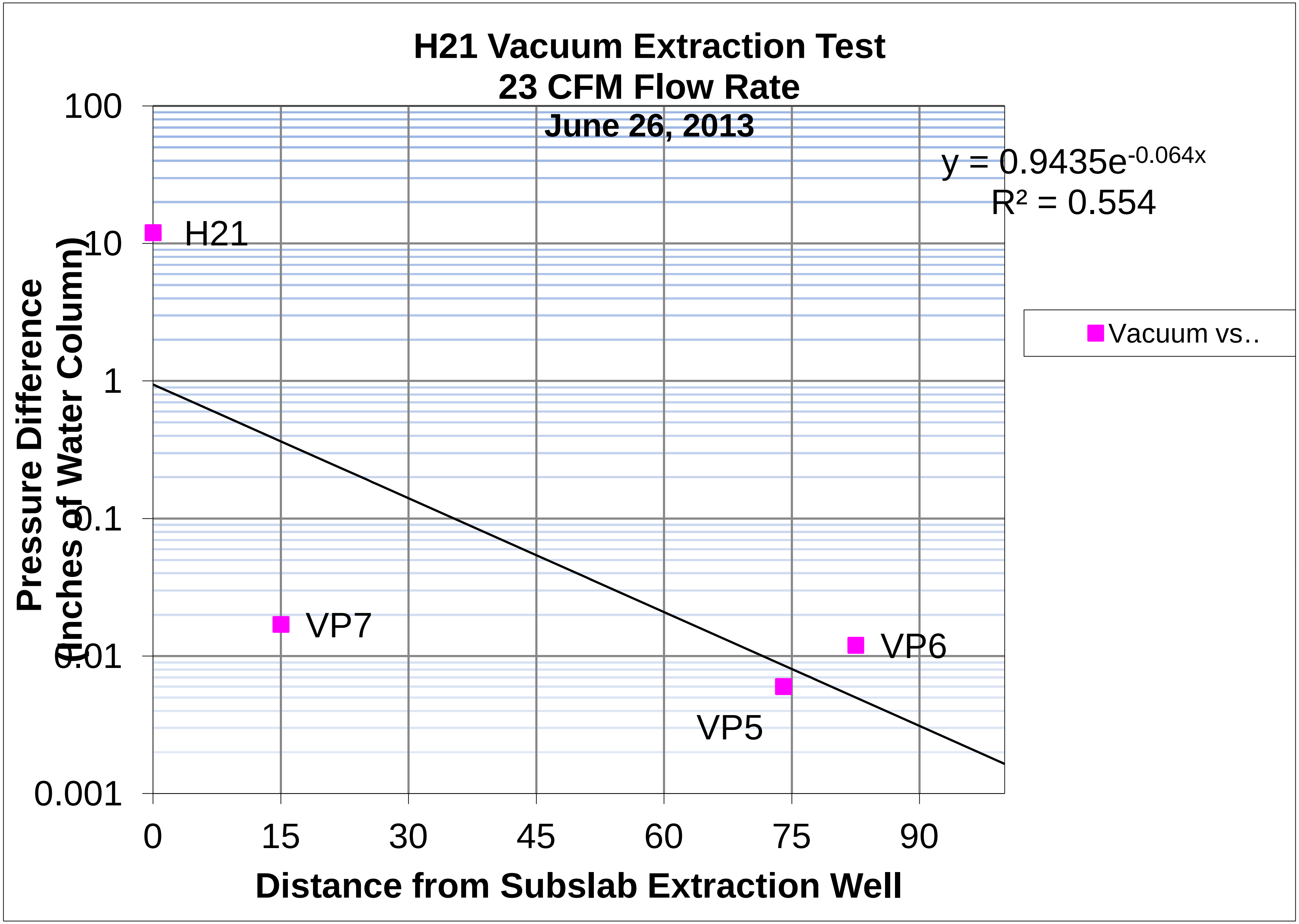
Checked By: .



Pier Assessment Vacuum-Flow Data.xlsx

Prepared By: RJC
Checked By: .



Pier Assessment Vacuum-Flow Data.xlsx

Prepared By: RJC
Checked By: .

APPENDIX L

SCHEDULE

Proposed Schedule to Implement Remedial Activities
Torx Facility, 4366 North Old US Highway 31, Rochester, Indiana

Task Name	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53	Week 54	Week 55	Week 56	Week 57	Week 58	Week 59	Week 60	Week 61	Week 62	Week 63	Week 64	Week 65	Week 66	Week 67	Week 68	Week 69	Week 70	Week 71	Week 72	Week 73
Preparation for Field Activities																																																																									
HASP Preparation	■																																																																								
Mobilization / Demobilization		■	■																																																																						
Clearing & Grubbing Injection Zones A, B, & C			■																																																																					
Surveying Layout of Injection Wells				■																																																																				
Sub-Slab Depressurization System																																																																									
SSD System Installation								■	■	■	■	■																																																													
SSD System Start-up													■	■																																																									
Injection Well Installation																																																																									
Source Area Behind Plant					■	■	■																																																																		
Observation Well Installation					■	■																																																																		
Treatment Zone D							■	■	■	■	■	■	■	■																																																											
Treatment Zone A								■	■	■	■	■																																																													
Treatment Zone B								■	■	■	■	■	■																																																											
Inside Plant Building													■	■	■	■	■	■	■	■	■																																																			
Treatment Zone C														■	■	■	■																																																								
Well Development							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																																				
ERD Injections using Product ABC																																																																									
Treatment Zone A													■	■	■	■	■																												■	■	■	■	■																										
Source Area Behind Plant														■	■																										■	■																			■	■												
Treatment Zone D																		■	■	■	■	■																			■	■																								■	■						
Treatment Zone C																						■	■	■	■	■	■																																	■	■	■	■	■	■								
Treatment Zone B																							■	■	■																														■	■	■																
Inside Plant Building																												■	■	■																											■	■	■															
ZVI Injection																																																																									
Site Preparation & Restoration ZVI Injection								■	■	■	■	■	■																																																												
EC Logging								■	■																																																																	
Source Area ISCR using ABC+									■	■	■	■																																																													
Post Injection Activities																																																																									
Performance Groundwater Monitoring																													■	■												■	■													■	■												■	■				
Report Preparation																															■	■	■	■	■	■								■	■	■	■											■	■	■	■										■	■	■	■

APPENDIX M

BLOWER CURVE PROPOSED SSD SYSTEM

FAN SELECTION
And
PERFORMANCE

Your Cincinnati Fan Representative:
Gina Kelley
Lathrop Trotter
5098 Oaklawn Drive
Cincinnati OH 45227
513-731-5000 Phone
513-731-5004 Fax
sales@lathroptrotter.com

Monday, August 5, 2013

Job Name:	AMEC
Reference:	Quote: 247706

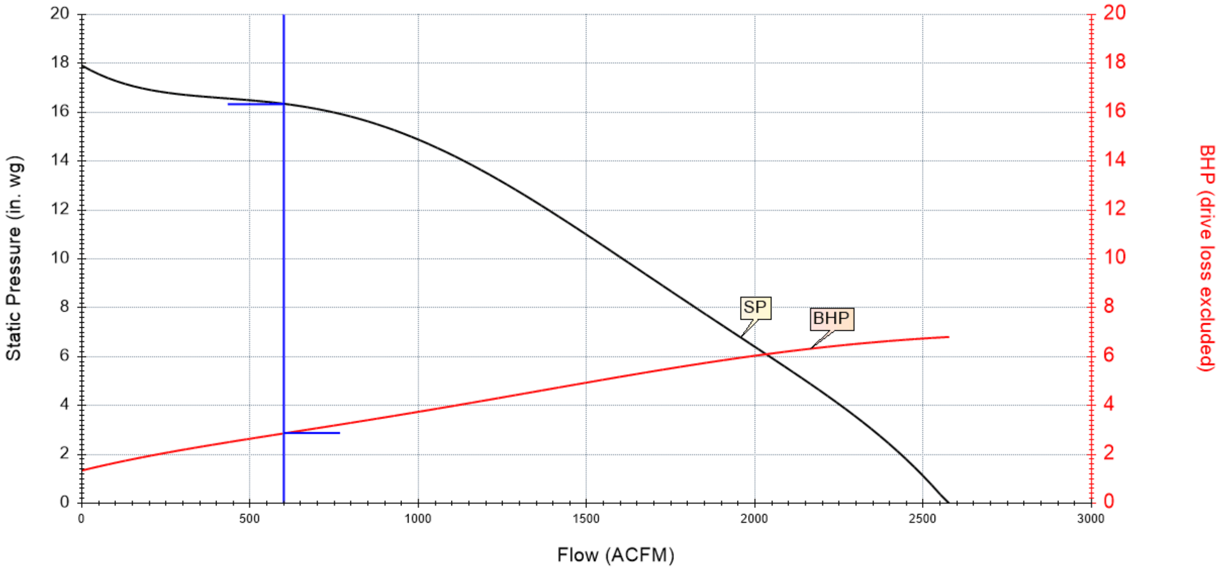
Operating Requirements

Volume, ACFM	600
Static Pressure, in. wg	16.0
Density, lb./ft.³	0.075
Operating Temperature, °F	70
AMCA Arrangement No.	4
Motor Frequency, Hz	60
Start-Up Temperature, °F	70

Fan Selection and Specifications

Model	PB-15A		
Fan RPM	3,500		
Wheel Description	Cast Alum. 16-1/2 X 4-3/8 BC		
Wheel Width, %	100%		
Wheel Diameter, in.	16.50		
Inlet Diameter, in.	7.00		
Outlet Velocity, ft./min.	1,737		
Fan BHP	2.87	Suggested Motor HP:	3.0
Static Efficiency, %	54.2%		
Cold Start BHP	2.87		
Construction Class	N/A		

PB-15A Cast Alum. 16-1/2 X 4-3/8 BC Wheel (Full Width) @ 3,500 RPM
Rating Point: 600 ACFM @ 16.0 in. wg SP, 0.075 lb./ft.³ Density, 2.87 BHP, 7.0 in. Inlet



CFSWin Version: 8.0.4947.13840 Database Version: 8.0.5

APPENDIX N

QAPP – GROUNDWATER DATA COLLECTION, SAMPLING, AND ANLAYSES

QUALITY ASSURANCE PROJECT PLAN FOR SAMPLE COLLECTION, ANALYSES, AND VALIDATION

FORMER TORX FACILITY
4366 NORTH OLD US ROUTE 31
ROCHESTER, INDIANA

Prepared for:

TEXTRON, Inc.

Prepared by:

AMEC Environment & Infrastructure, Inc.
Miamisburg, Ohio

June 2014

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1.0 INTRODUCTION

This quality assurance project plan (QAPP) has been prepared by AMEC Environment & Infrastructure, Inc. (AMEC) to describe the sample collection and analytical procedures for media sampling associated with the chlorinated hydrocarbon plume beneath the former TORX facility (Site) in Rochester, Indiana. Properties where media could be sampled include the Site and down-gradient properties located east, south, and southeast of the Site. This QAPP is an appendix of the Remediation Work Plan (RWP) (AMEC, June 2014). Project investigation objectives, investigation scope, sample location maps and rationale for groundwater and air sampling events are described in the Work Plan.

The Data Quality Objectives (DQOs) for this project include:

(1) obtain data of sufficient quantity and quality to evaluate the effectiveness of the remedial action

(2) obtain data of sufficient quantity and quality to evaluate if plume concentrations are stable or declining following remedial actions

(3) obtain data of sufficient quantity and quality to evaluate if COC concentrations in off-site wells are attenuating to MCLs.

Remediation activities are based on general procedures found in the IDEM Remediation Closure Guideline (IDEM, 2012) and project-specific procedures presented in this Work Plan.

1.1 PROJECT IDENTIFICATION

Facility Information

- Site Name: former TORX facility
- State Cleanup Site Number: 7100149
- Mailing Address: 4366 North Old US Highway 31 Rochester, Indiana 46975
- Telephone Number: Contact Mr. Jamieson Schiff, Textron, Inc, 40 Westminster Street, Providence, Rhode Island 02903 (401) 457-2422

A site location map is attached as Figure 1.

Current Owner Information

- Current Owner/Operator Name: Acument Global Technologies, Camcar LLC-Rochester

Operations

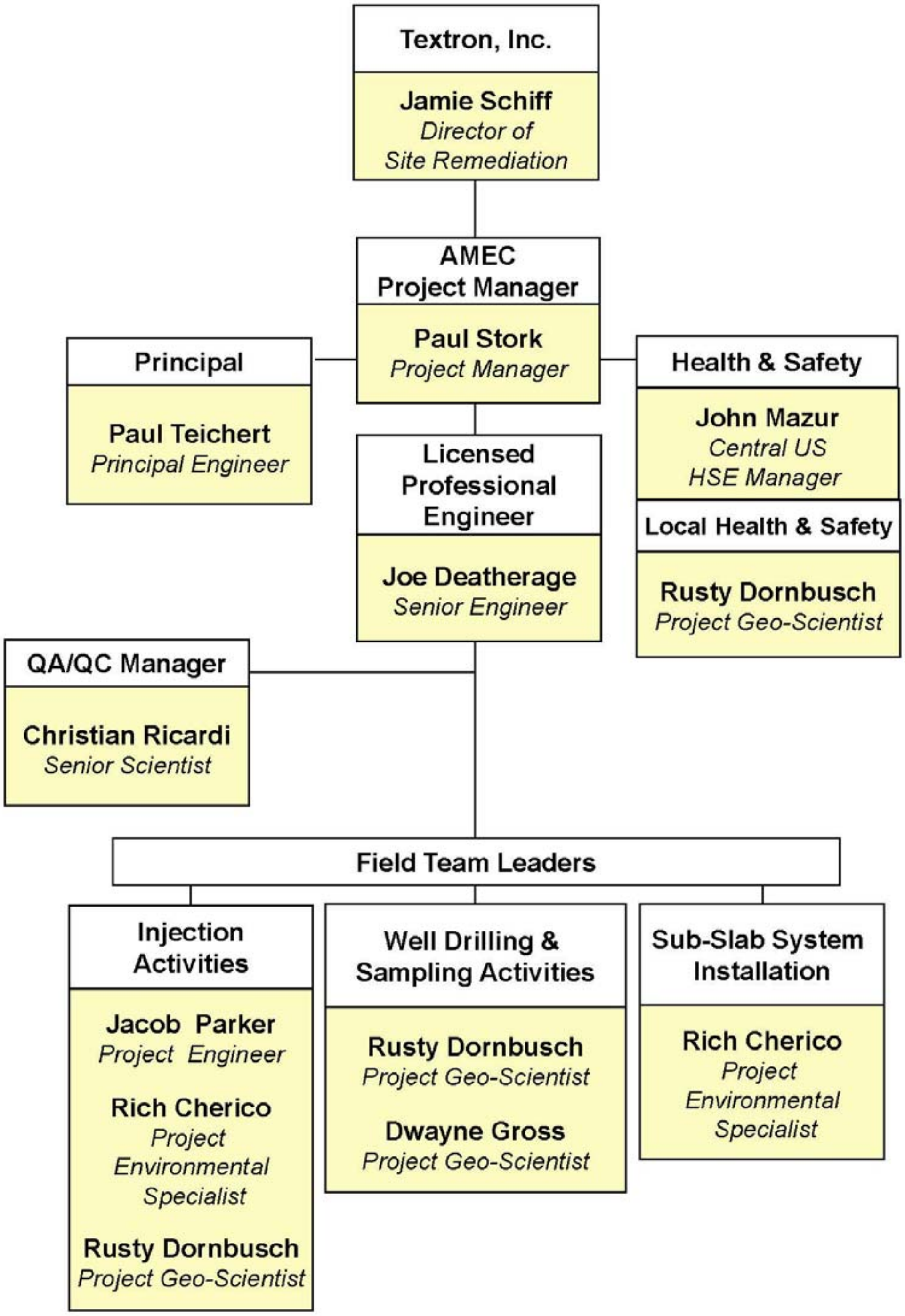
- Mailing Address: 4366 North Old US Highway 31 Rochester, Indiana 46975
- Telephone Number: (574) 223-3131

1.2 PROJECT TEAM

AMEC's field investigation will be directed by Mr. Paul Stork under the review of Mr. Joe Deatherage. Field team leaders for AMEC (listed below) will be responsible for oversight of, soil and groundwater data collection, sampling, and injection . Mr. Stork has over 25 years experience in the performance of subsurface investigations in glacial terrains. Mr. Deatherage is a licensed engineer in the State of Indiana and has extensive experience pertaining to environmental subsurface investigations and remediation of chlorinated hydrocarbon plumes.

The project team also includes several subcontract analytical laboratories that will be performing analytical testing on the groundwater and vapor samples that will be collected during the implementation of the remediation work plan. ALS Laboratories, in Holland, Michigan will be performing the majority of the groundwater analyses for the performance, plume stability and annual monitoring. Pace Analytical Energy Services (formerly Microseeps) in Pittsburgh, Pennsylvania will analyze the dissolved gases and volatile fatty acids as part of the performance monitoring, and Microbial Insights, in Knoxville, Tennessee will analyze the bacteria populations in groundwater for the performance monitoring. In addition, ALS in Cincinnati, Ohio will analyze the vapor samples collected from the Sub-slab depressurization system and from inside the TORX facility. Organization charts for each laboratory are presented in Appendix B in each of the laboratory's QAPP.

The following is an organizational chart for AMEC.



AMEC will contract Territorial Engineering LLC (Territorial) in Walkerton, Indiana to survey horizontal and vertical control coordinates of newly-installed soil borings and/or monitoring well locations. The North American Vertical Datum 1988 will be used for vertical elevation control. Territorial performed the survey work during the Further Site Investigations (FSIs). Territorial will use previously established benchmarks and control points for the survey work.

2.0 SAMPLE COLLECTION PROCEDURES

The purpose of this section is to define the procedures that will be used to collect the environmental samples that will be required during the implementation of the RWP. The majority of the samples that will be collected will be groundwater, however, there will be a limited number of indoor air samples collected as part of the sub-slab depressurization system operation. While sub-slab vapor and soil samples are not anticipated to be collected during the implementation of the remediation work plan, these sample collection details are included in the QAPP for completeness in case either of these sampling becomes warranted.

2.1 SOIL SAMPLING PROCEDURES

No soil analytical samples are planned. However, if it is deemed necessary to collect soil samples from the Site for laboratory analyses, the following procedures will be used.

In the event additional soil sampling is required to delineate the extent of impact requiring corrective actions at the Site or at locations down-gradient of the Site, the following field procedures will be followed. Soil samples will be collected using split-spoon, soil liners, hand augers, and/or Shelby tube equipment. Recovered soil samples (with the exception of the Shelby tube) will be split to allow for screening of each sample interval for the potential presence of volatile organic compounds. Soil samples could be collected for geological characterization profiling prior to and during implementation of remediation action.

In accordance with the IDEM sampling guidance for VOCs “Sampling Soil and Waste for Volatile Organic Compounds (VOCs), Revised August 15, 2012”, soil samples collected for potential VOC analysis will be placed into appropriate laboratory supplied containers immediately after sample retrieval to minimize the potential for volatilization prior to extraction procedures associated with Indiana Method 5035A .

Specific sampling procedures and screenings are described in detail as follows:

2.1.1 Sample Procurement

Split-Barrel Sampling

An assembled standard stainless steel split-barrel sampler is a circular cylinder with an inner diameter of approximately 1.4-inches and a length of 1.5 or 2 feet.

- A 140-pound hammer falling 30 inches is used to drive the sampler 2-feet into the base of the borehole to collect the soil sample. The number of blows required to advance the sampler every six inches is recorded.

- The split-barrel sampler is retrieved from the borehole, dis-assembled, and the soil core is placed on aluminum foil for immediate sampling for potential VOC analyses and characterization.

- The soil core is split into halves using stainless steel sampling equipment and placed in the appropriate sample containers for laboratory analyses and/or organic vapor headspace screening.

The soil sample will be classified by the AMEC representative responsible for supervision of the drilling and sampling activities. The soil classification and standard penetration testing (SPT) will be recorded on the Soil Test Boring Field Report. Split-barrel sampling procedures are specified in ASTM Method D-1586-84.

Direct-Push Sampling

A 4-foot long steel macro-core sampler lined with a new disposable acetate liner is hydraulically advanced into the soil and then retracted to obtain discrete soil samples.

- The decontaminated sampler is assembled with a new, disposable liner.

- The sampler is seated at the top of the interval to be sampled.

- The sampler is advanced 48 inches into the soil profile using a hydraulic ram to collect the soil core.

- The sampler is retrieved from the borehole, disassembled, and the liner containing the soil core removed and cut open to access the soil core. The recovered soil core is placed onto aluminum foil and “cut” near the longitude midpoint to form two discrete, soil cores up to 24-inches long depending on sample recovery.

- The discrete soil core is split into halves using stainless steel sampling equipment and placed into appropriate containers for organic vapor headspace screening and/or laboratory analyses.

The soil sample will be classified by the AMEC representative responsible for supervision of the drilling and sampling activities. The soil sample interval and classification will be recorded in the field log book.

Hand Auger Sampling

A stainless steel, bucket hand auger is manually advanced into the soil using a “T”-handle and sample rod assembly and then retracted to obtain discrete soil samples.

- The decontaminated hand auger is assembled to the appropriate length depending on the scheduled sample depth/interval.
- The auger is seated at the top of the interval to be sampled.
- The sampler is advanced approximately 6 inches into the soil profile by manually twisting and pushing the hand auger into the soil to collect the soil sample in the auger.
- The auger is retrieved from the borehole, disassembled, and the soil sample manually recovered from the auger with stainless steel sampling equipment or gloved hands (new, disposable gloves to be donned for each sample interval). The soil sample is placed onto aluminum foil or into a stainless steel bowl
- The soil sample is then placed in the appropriate sample containers for organic vapor headspace screening and/or laboratory analyses. Soil samples over each 2-foot interval may be collected in the field as composites from each discrete 6-inch sample sub-interval.

The soil sample will be classified by the AMEC representative responsible for supervision of the sampling activities. The soil sample interval and classification will be recorded in the field log book.

Shelby Tube Sampling

A Shelby Tube is a seamless thin-wall steel tube with an inner diameter of 2.85-inches and a length of 1.5 feet.

- The Shelby Tube is slowly "pushed" to a depth of 1.5 feet below the base of the borehole using drilling rig hydraulic pressure methods.
- The Shelby Tube is slowly retrieved from the borehole and disconnected from the drill stem.
- Both ends of the Shelby Tube are sealed with paraffin wax so that an "undisturbed" soil sample is encased within the sampling device.
- The sealed Shelby Tubes soil sample is placed within a hollow shipping tube, the annulus filled with vermiculite and the shipping tube sealed.

2.1.2 Field Screening Measurements

A photoionization detector (PID) will be used to screen samples for total organic vapors in the field. Organic vapor headspace screening procedures are designed to promote volatilization of organic vapors into the headspace of the sampling container (jar or zip-lock plastic bag). The degree of this volatilization is dependent on the temperature, exposed surface area, and other factors in addition to organic concentrations. The PID is calibrated to read in meter deflection units relative to a gas standard (generally isobutylene) however, a variety of organic compounds will produce a response if volatile constituents are present. PID instruments are calibrated daily and calibration information is documented in field logbooks. Readings obtained with these instruments therefore should not be confused with concentrations of any specific compound.

Following the collection of the sample aliquot for laboratory analyses, the following steps will be used for headspace screening:

- For non-cohesive soils, fill a zip-lock plastic bag approximately half full with loose, crumbled soil.
- For cohesive soils, break the sample into several pieces to increase the surface area.
- Place the bag in a relatively warm location (at least 20°F above the average annual temperature in the area) for approximately 10 minutes.
- Insert the probe of the PID by piercing through the bag and into the vapor headspace.
- Record the maximum identified reading over a 15 second period.

The procedure encourages any volatile organics to enter the vapor phase thus allowing for measurement by the headspace technique. Only a portion of the soil sample is required for the headspace analysis. The portion of the sample that is sent to the laboratory will be excluded from the headspace analysis.

2.2 MONITORING WELL DEVELOPMENT

Monitoring wells that will be installed as part of this investigation will be developed using the following procedures:

- Development/purging of wells will be accomplished by pumping or manual bailing techniques, depending on the depth of the well and the volume of water required to be evacuated. Development activities can be initiated after a minimum period of approximately 24 hours to allow seal materials within the well to properly set up. Purged water will be containerized for proper disposal, as required.
- If pumping is used to complete development or purging activities, new, disposable sections of tubing will be used to evacuate water from the wells. The pump will be properly cleaned prior to being introduced into a well. The pump will be immersed and agitated within a water and non-phosphate soap solution, liberally rinsed with tap water, followed by a thorough rinse with distilled water.
- Development activities will be considered successful once water quality measurements

stabilize (within approximate 10 percent variance over three successive measurement intervals), the sediment load within the evacuated water is noted to be reduced, and a minimum of five well bore volumes of water have been evacuated. In the event that the sediment load in the extracted water is not significantly reduced, the well will be considered developed upon the evacuation of ten well volumes.

- Groundwater purging and sampling may be initiated after a minimum period of approximately 24 hours after development activities are completed.

2.3 GROUNDWATER SAMPLING PROCEDURES

Groundwater samples will be collected from the monitoring well network using low-flow sampling techniques and the use of re-usable pumps fitted with disposal sections of tubing. There are nine monitoring wells (MW-11, MW-12, MW-13, MW-65(32), MW-67(30), MW-68(32), MW-71(33), MW-72(32), and MW-75(32)) in the monitoring well network that are constructed of a small 1-inch inner diameter well casing. The low-flow sampling pumps will not fit inside these casings. Groundwater samples will be collected from these wells using disposable polyethylene bailers using standard three well casing volume purging techniques..

Purging, and Sampling Procedures

The field measurement procedures to be used for this RWP consist of (1) measuring the water level in each well prior to, during, and after sampling the well, and (2) measuring physical properties of the water— specific conductance, pH, temperature, turbidity, oxidation reduction potential (ORP) and dissolved oxygen (DO)—while pumping water from the well to remove stagnant water from the well casing. When purging or collecting groundwater samples from the monitoring wells, personnel will follow the procedures below:

- Verify that the well and the protective cover are not damaged. Immediately notify the Project Principal if well damage is suspected. PVC wells may be repaired or replaced if damaged or degraded.

- Carefully remove well cover and water tight cap to avoid causing foreign material to enter the well.

- Don new disposable nitrile gloves. After collecting groundwater samples from each well, the gloves are to be disposed of properly.

- Prior to sampling each well and during the sampling procedure, the groundwater level will be measured using an electronic water level probe and noted in a field log book. The monitoring wells will be opened for approximately 15-minutes prior to measuring the depth to water.

- Proper operation of the water level indicator will be checked daily. A second water level indicator will be brought in the field vehicle as a backup in case of instrument malfunction. Water level measuring equipment will be properly cleaned prior to being introduced into a well. The probe and/or tape will be washed with water and non-phosphate soap solution, liberally rinsed with tap water, followed by a thorough rinse with distilled or de-ionized water.

- The depth to groundwater from the reference point will be measured to the nearest 0.01 foot and recorded in the field log book. If the reference mark cannot be identified, the measurement will be obtained from the north side of the well casing. This fact will be noted in the field log book.

- After determining the depth to groundwater, between wells, the water level indicator tape will be washed with water and non-phosphate soap solution, liberally rinsed with tap water, followed by a thorough rinse with distilled or de-ionized water.

- A submersible sample pump will be used for purging and sampling. Lower the decontaminated pump so that the pump intake is at the midpoint of the screen. Before starting the pump, measure the water level with the decontaminated water level indicator. The flow rate will be maintained <500 mL/min to minimize drawdown and to avoid undue pressure, temperature, or other physical disturbances to groundwater over the sampling interval. Measure the water properties every 5 minutes during purging. Groundwater samples will be collected at a flow rate of ≤250 mL/min, such that the drawdown of the water level within the monitoring well did not exceed the maximum drawdown when possible. Measurements of the physical properties will be obtained during purging of the monitoring well. To make the water property measurements, the discharge tubing from the sample pump will be attached to a flow chamber, and the multi parameter sonde will be placed into the flow chamber. If the multiparameter sonde does not include turbidity, turbidity will be measured by filling a bottle from the flow chamber's discharge hose and inserting the bottle into the turbidimeter. Measurements are considered stable when three consecutive readings, made at 3 to 5-minute intervals are within the acceptable stability ranges (±0.1 for pH, ±3% for specific conductance and temperature, ±10 millivolts (mV) for ORP, ±10 nephelometric turbidity units (NTU) for turbidity, and ±10% for DO).

- Sample collection from low-yield wells may commence immediately following water quality parameter measurements and attainment of stable readings. For the nine small diameter monitoring wells previously identified, a minimum of three casing volumes of water will be purged from each small diameter well prior to sampling.

- Groundwater sampling shall be performed using sampling pumps equipped with dedicated disposable tubing. For several wells where the use of pumps is not possible, disposable bailers will be used to collect all samples including VOC samples. If the recharge rate of the well is insufficient to obtain a complete suite of samples within 24 hours after purging, as many of the required samples as possible will be obtained with water that is available in the well.

- If low-flow sample collection procedures cannot be utilized due to the well diameter, sample collection shall be performed in such a way as to minimize unnecessary agitation of the sample.

- Groundwater samples shall be collected and contained in a prescribed sequence that reflects the volatilization sensitivity of the parameters to be determined. The samples will be collected in this order: VOCs, dissolved gases, volatile fatty acids, total organic carbon, anions, bacteria, and metals.

- Samples will be containerized and preserved according to the analysis method's requirements. The containers will be labeled to reflect the specific parameter that the sample will yield; this scheme will match any pre-emplaced (by the laboratory) preservatives with the appropriate parameter according to the collection sequence.

- Sample containers will be labeled in a legible fashion that should remain clear even when wet. The labels will, at minimum, exhibit the following information:
    - Sample identification number (in accordance with Section 3.0 in this QAPP)
    - Date and time of collection
    - Analyses required
    - Project or collector's name

- The groundwater samples will be carefully packaged in a cooler with ice for shipping to the laboratory.

- Groundwater samples will remain in the possession of the sampling team until they are transferred to the shipper. If the samples are kept overnight, they will be stored in a secure area until they are relinquished to the shipper under chain-of-custody procedures.

- In between sampling locations, the pump will be immersed and agitated within a water and non-phosphate soap solution, liberally rinsed with tap water in a separate container followed by a thorough rinse with distilled water. The decontamination water will be containerized with the purge water.

- Upon completion of the groundwater sample collection, the total depth of the well will be measured using a weighted tape. Between wells, the weighted tape will be washed with water and non-phosphate soap solution, liberally rinsed with tap water, followed by a thorough rinse with distilled or de-ionized water.

A chain of custody (COC) will be completed for each sample shipment to the laboratory and will reflect the above information and the number of sample containers from each location. To prevent water damage to paperwork accompanying samples to the laboratory, all paperwork will be placed inside plastic bags. In coolers, the bags containing the paperwork will be taped to the underside of the lid. An example of a COC form is found in Appendix A.

2.4 Vapor and Air Sampling Procedures

The work will generally follow the procedures outlined in the Indiana Department of Environmental Management (IDEM) Remediation Closure Guide (RCG) that became effective on March 22, 2012 and was later revised on July 9, 2012.

For vapor sampling events, barometric pressure and temperature should be recorded at the beginning and end of sampling activities. This information may be obtained from websites reporting local weather conditions.

Sample collection and analysis procedure are summarized in the following sections.

2.4.1 Sub-Slab Vapor Sampling

In the event that sub-slab vapor sampling is required, the following field procedures will be followed. Prior to sample collection of sub-slab vapors, a detailed survey of the building and the activities of the occupants will be performed and the Indoor Air Building Survey Checklist included in Appendix IV of the 2006 IDEM Draft Vapor Intrusion Pilot Program Guidance (DVIPPG) will be completed. A copy of this checklist is found in Appendix A. If IDEM updates this checklist, the updated checklist will be used. As of May 2014, IDEM recommends using the checklist included in the 2006 DVIPPG (Remediation Closure Guide, March 22, 2012).

The sub-slab vapor samples will be collected for a period not less than 8 hours but not more than 24 hours. The sample collection period will be determined on a case by case basis. Sample collection activities will be documented on an Indoor Air and Soil Vapor Sampling Form found in Appendix A.

Sampling of sub-slab vapor probes will require leak testing prior to sample collection. Leak testing is necessary to ensure that vapor samples are actually collected from the sub-slab and not from indoor air or ambient air. To prepare for the leak test, one to three volumes of air will be purged from the vapor probe. The maximum flow rate will not exceed 200 milliliters per minute (ml/min) in order to minimize the potential for vacuum extraction of the volatile organic compounds from the soil. During the purging of the vapor probe, the vapor probe will be leak tested using a helium chamber and a portable helium monitoring device. If greater than 10 percent of helium is detected in the vapor probe, the surface connections will be checked and tightened, and the leak test will be conducted again. If the vapor probe leak test fails a second time, additional sodium silicate will be added to the annular space, allowed to cure for a minimum of 4 hours and the vapor probe will be re-tested. If helium is detected during the re-test at greater than 10 percent, the vapor probe will be abandoned and an additional vapor probe will be installed next to the abandoned vapor probe.

Once the sub-slab vapor probe has passed the leak test, a pressure reading of the sub-slab vapor probe will be measured using a manometer that can measure 0.001 inch of water column. The differential pressure reading between to sub-slab vapor probe and indoor air will be recorded.

Sub-slab vapor samples will be collected using pre-cleaned, flow controlled, evacuated, 6-liter, stainless steel Summa® canisters, which will be placed on the ground adjacent to the monitoring point location. The 6-liter Summa® canisters will be equipped with flow regulators and a vacuum gauge. After the leak tests are completed at the sub-slab vapor probe, the vapor probe, indoor air, and outdoor air will be sampled over a designated time period (i.e. 8 to 24 hour) using 6-liter Summa® canisters. The flow rate during the sampling event will not exceed 200-ml/min.

Prior to collecting a sample from each sub-slab vapor probe, each sub-slab vapor probe will be developed and purged using the following procedure.

- A new pair of disposable gloves will be worn at each sub-slab soil vapor probe.
- Carefully remove protective caps to avoid causing foreign material to enter the soil vapor probe.
- Development activities can be initiated after a minimum period of approximately 72 hours to allow seal materials around the sub-slab vapor probe to properly set up.
- Purging of the sub-slab vapor probe will be accomplished by pumping or manual vacuum extraction techniques, depending on the volume of vapors required to be evacuated from the sample train.
- Development and purging will be performed at a flow rate not to exceed 200-ml/min to minimize excessive agitation of sub-slab vapors.
- If pumping is used to complete development or purging activities, new, disposable sections of tubing will be used to evacuate vapors from the soil vapor probe. The pump will be properly calibrated prior to being connected to the soil vapor probe.
- Purging activities will be considered complete when a minimum of three sample train volumes of vapors have been evacuated.

When sampling the sub-slab vapor probes and indoor/outdoor air, personnel will follow the procedures below:

- Wear new disposable gloves. A fresh pair of gloves will be worn at each sample location.
- Vapor and air sampling may be initiated immediately after purging activities have been completed.
- Sample collection shall be performed in such a way as to minimize unnecessary

agitation of the sample.

- Sample containers will be labeled in a legible fashion that should remain clear even when wet. The labels will, at minimum, exhibit the following information:
  - Sample identification number
  - Date and time (start and stop) of sample collection
  - Canister and flow regulator identification number
  - Initial and ending vacuum readings
  - Analyses required
  - Project Number
  - Sampler's name

The vapor samples will be submitted to ALS Laboratories in Cincinnati, Ohio under chain of custody. The chain of custody form will include the above information and the number of sample containers from each location. This sample information will be shown on laboratory reports.

2.4.2 Indoor and Outdoor Air Sampling

The air samples will be collected using pre-cleaned, flow controlled, evacuated, 6-liter, stainless steel Summa® canisters, which will be placed between three and five feet above the floor and/or ground. The ambient (outdoor) air sample(s) will be collected at a location that is at least 15 feet upwind from the building of interest, and away from obvious potential VOC sources (parked vehicles, fuel tanks, etc.). The indoor air samples will be biased toward potential high-use areas. The exact locations of the air samples will be determined in the field and documented on the Indoor Air and Soil Vapor Sampling Form found in Appendix A.

The indoor and outdoor air samples will be collected simultaneously with the sub-slab samples (if required). Sample collections time periods (8 hour to 24 hour) will be determined based on project objectives defined in the Work Plan. For most indoor air locations an 8 hour sample will be collected. Flow controllers will be provided by the laboratory and will have a rate set for the appropriate time period.

For situations where outdoor background is evaluated with ambient air samples, sampling of the outdoor ambient air will begin approximately one hour prior to the commencement of the indoor air sampling and end approximately one hour after the completion of the indoor air sampling.

2.4.3 SSD System Discharge Sampling

Upon completion of start-up operations, one sample of air that is discharged from the SSD System will be collected from a ¼ diameter sampling port located on the discharge side of the SSD system blower. Refer to Figure 9-5 in the Remediation Work Plan for the sampling port location. The air sample will be collected using pre-cleaned, flow controlled, evacuated, 6-liter, stainless steel Summa® canister. Ambient paramteres will be measured and recorded in the field notebook (i.e., temperature, atmospheric pressure, pressure, etc.) at the time of sample collection.

2.4.4 Laboratory Analysis – Soil Vapor, Air and SSD System Discharge

The sub-slab soil vapor sample(s) and air samples will be analyzed for VOCs using EPA Method TO-15. The samples will be sent to an off-site laboratory, ALS Laboratory Group in Cincinnati, Ohio, for analysis within the required analytical method holding time (30 days). A summary of target compounds and detection limits is provided on Table 1.

Proper sample container preparation and sample preservation measures in the field are important to prevent sample composition from being altered by contamination, degradation, biologic transformation, chemical interactions, or other factors during the time between sample collection and analysis. The sample container will be prepared by the laboratory in accordance with EPA TO-15 procedures and will be certified as pre-cleaned.

The sub-slab soil vapor and air samples will be analyzed on a 10-day turn-around time. Once received, AMEC will compare analytical results for the soil vapor sample(s) to applicable IDEM regulations.

3.0 FIELD DOCUMENTATION

Field records will consist of field logbooks, field sampling forms and checklists, sample location maps, and chain-of-custody forms. Field records will be written in indelible ink. Documentation errors will be corrected by drawing a single line through the error so that it remains legible. The error will then be initialed by the responsible individual and the date of the change noted. The correction will be written adjacent to the error.

Sample collection information will be documented as follows:

- Field logbooks will be completed by the field sampler at the time that field investigations are completed. For each sampling event: the site name and location, date, starting and ending times, weather, names of all people involved in sampling activities, level of personal protection used, documentation of calibration of field equipment, documentation of adherence to protocol, deviations to planned protocol, names of visitors to the site during sampling and reason for their visit, unusual observations, and signature or initial of the person recording the information. For each individual sample: a detailed description of location, any measurements made, the unique sample number assigned, the time the sample was taken, physical description of sample, depth from which sample was collected, whether grab or composite (if composite, how composited), equipment used to collect the sample, volume and number of sample containers, how sample is preserved, and signature of sampler.
- For vapor sampling events, barometric pressure and temperature should be recorded at the beginning and end of sampling activities. This information may be obtained from websites reporting local weather conditions.
- Field Sampling Records are provided in Appendix A. Records are included for sample handling and shipment (COC Form), and sub-slab air sampling probe construction, and air sampling.
- Sample Identification Nomenclature: The environmental media samples collected as part of this work plan will use the following nomenclature for efficient identification of the sample media and date of sample collection. The nomenclature proposed to be utilized is as follows:

  For example groundwater sample from well MW-X collected on Dec 25, 2008 would be identified as ATR-MWX-G122508 (AMEC-Torx-Rochester- well number-Groundwater month date year). Sampling depth will also be entered to the field sample ID.

  Vapor and air samples would be identified with media codes SV (soil vapor), SS (sub-slab), IA (indoor air), SSD system emissions (SSDSEM) and AA (ambient air). Field sample ID includes media codes with the format: for a soil vapor sample ATR-SV5-5.5122513 (AMEC-Torx-Rochester- vapor well number-Vapor depth range month date year).

  Collection of soil samples is not scheduled under the Work Plan. In the event that soil samples are scheduled in future investigations, codes for soil types and field sampling ID formats will be specified in a work plan addendum.

Field replicate samples may be collected to assess sampling and analytical precision. Each field replicate will be given its own unique sample number. The nomenclature proposed to be utilized is as follows:

For example a replicate groundwater sample from well MW-X collected on Dec 25, 2008 would be identified as ATR-MWX-G122508R (AMEC-Torx-Rochester- well number-Groundwater month date year replicate); Vapor samples would be identified as ATR-MWX-SV5-5.5122508R (AMEC-Torx-Rochester- vapor well number-Vapor depth range month date year replicate).

A site map documenting sample collection points and locations of monitoring wells will be included as part of our field records. Chain-of-custody forms and calibration records are discussed in Sections 5.0 and 6.0 of this QAPP.

4.0 LABORATORY ANALYSIS AND DATA MANAGEMENT

Groundwater and air samples (soil vapor, sub-slab vapor, indoor air, and ambient air) are specified in the Work Plan.

Groundwater samples that will be collected during the performance groundwater monitoring and stability groundwater (excluding microbiology testing) and annual groundwater monitoring will be analyzed using NELAC or NELAP certified laboratories. ALS Laboratory Group is the preferred laboratory for VOC analysis using EPA Method 8260C in groundwater samples. In addition to analyzing for VOCs, ALS was selected for analysis of select metals and inorganic compounds in groundwater. Table 2 presents the list of target 8260 compounds, practical quantitation limits (PQLs), and method detection limits (MDLs) for this project. Additional parameters to be analyzed by ALS include total organic carbon (TOC), alkalinity, iron, manganese, arsenic, selenium and anions (nitrate, sulfate, chloride) are presented on Table 3 along with the corresponding methods and MDLs.

Two additional laboratories have been selected for this project for analyses of Redox parameters to aid remediation decisions for the Site. Redox parameters are presented on Table 3 and include VFAs, dissolved gases, and microbial gene populations. Pace Analytical Energy Services (formerly Microseeps)in Pittsburg, Pennsylvania will provide analytical services for the VFAs and the dissolved gases. Microbial Insights in Knoxville, Tennessee will provide analytical services for the microbial gene populations.

Air samples will be analyzed using USEPA Method TO-15. Samples will be collected in 6 liter SUMMA® canisters. Air concentration will be reported in units of micrograms per cubic meter (µg/m^3). A summary of sample collection specifications for all methods is included on Table 4.

Laboratory analytical parameters, methods, detection limits, and quality control methods to be utilized during this project are summarized in each of the laboratories quality assurance manuals. The laboratory's quality assurance manuals for this project are presented in Appendix B.

5.0 SAMPLE AND DOCUMENT CUSTODY

This section describes the record keeping activities for recording and maintaining field information, and field chain of custody protocols used to document sample transfer to the subcontracted laboratory. Expanded discussions of laboratory-related QA/QC protocol and methodologies are provided in each of the laboratory's Quality Assurance Program Plan presented in Appendix B.

5.1 PROCEDURES FOR MAINTAINING SAMPLE CONTROL AND QUALITY ASSURANCE

To provide for proper identification in the field and proper tracking in the laboratory, all samples are labeled in a clear and consistent fashion. Sample labels should be waterproof, and have a pre-assigned, unique number that is indelible. Sample identification nomenclature is described in Section 3.0.

Both field and laboratory records will be created throughout the sampling and analysis period. These records will provide documentation of the procedures used, observations made, results obtained, and pertinent logistical information. Also to be documented are any deviations from the procedures specified within this plan. The records must contain sufficient information to allow reconstruction of the sample collection and handling procedures at a later time. Field records include field logbook notes and field data records (Appendix A) written by field personnel during the sampling activities.

Field data records in Appendix A are used to document air sample collection and sample custody. Field records include the following forms:

- Indoor Air Building Survey Checklist
- Indoor Air and Soil Vapor Sampling Form.
- Chain of Custody Forms

All documents will be maintained in a secured limited access area within AMEC.

The laboratory will document all processing steps applied to the sample as well as provide a chronology of its route through the laboratory work stream. The analyst's name(s) should also be recorded. In general, the laboratory logbook should provide the following information:

- Sample preparation techniques
- Instrumental methods

- Experimental conditions (sample volumes, dilutions, sample preparation and analysis details, method non-conformance)
- Presentation of analytical results from all laboratory blanks and quality control samples

5.2 CHAIN OF CUSTODY PROGRAM

The chain of custody program will facilitate the tracking of sample possession and handling from field collection through laboratory analyses. The chain of custody program consists of field and laboratory logbooks, sample labels, and Chain of Custody Record.

The Chain of Custody Record enables the sample history to be determined and will accompany each sample or lot of samples. An example COC used for groundwater is provided in Appendix A. The following information will be recorded:

- Site Name
- Sample Number
- Sample Type (groundwater)
- Date and Time of Collection
- Number and type of Containers
- Sample preservation notes
- Parameters (for which analyses are requested)
- Signature of Sampler(s)
- Signature of Persons Involved in the Chain of Custody
- Condition of Samples (upon arrival at laboratory)
- Dates of Possession

In cases where the samples leave the immediate control of the sampling team (i.e., shipment via a common carrier) the shipping container must be sealed with tape and a signed Custody Seal.

6.0 CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTATION

Following is a partial list of possible field equipment that requires periodic calibration:

- Water quality Meter(s)
- Photo-ionization Detectors (PID)
- Field Flame Ionization Detectors (FID)
- Portable Helium Monitoring Device

Verification of the ratio of instrument response to analyte amount, a calibration check, is done by analyzing for analyte standards in an appropriate media (gas or liquid). Field instruments will be calibrated daily and a record of field instrument calibration will be entered in the field logbook at the time that the calibration steps are completed.

6.2 FIELD MEASUREMENTS

Various water quality measurements will be recorded prior to collection of groundwater samples from the monitoring well using electronic water quality meter(s) calibrated to manufacturer’s specifications. Calibrations are checked daily and recorded in field logbooks.

6.3 EQUIPMENT CALIBRATION

Equipment shall be calibrated according to manufacturer's instructions or a generally accepted practice. Calibration of all instruments will be recorded in the field logbook. A routine schedule and record of instrument calibration shall be maintained throughout the study.

Water Quality Meter Calibration

Various water quality parameters shall be measured with an electronic water quality meter(s). Calibration of the instrument(s) is periodically performed at the factory or an authorized service center. The calibration of the instrument probe(s) shall be checked at the beginning of each day of use. The water quality instrument(s) will be standardized in the field for the respective water quality parameters being collected using calibration solutions recommended by the equipment manufacturer.

Helium Detector Calibration

The helium detector will be used to measure the tightness of the fittings in the sub-slab sampling train. The helium detector is calibrated at the factory or rental service department. It will be field checked prior to use using a portable tank of helium gas.

Portable Organic Vapor Analyzer Calibration

The hand-held portable organic vapor analyzer used to screen the air vapors at the head of the soil borings and in the breathing zone, shall be calibrated at the beginning of each day of use or after maintenance or repair. The battery power supply shall be recharged each evening prior to the next day of instrument use. An FID or PID will be used to identify organic vapors at the Site.

6.3.1 Calibration Nonconformance

Instrument calibration problems will be reported immediately to the Project Manager, who will arrange to replace defective instruments with instruments in proper working condition. Improper instrument calibration and any corrective action will be documented in the field logbook.

6.4 EQUIPMENT MAINTENANCE

All equipment shall be returned decontaminated. Any malfunctions shall be reported to the project manager, who will initiate any actions necessary for the repair or replacement of the equipment. Equipment maintenance logs are kept on file. Routine maintenance shall be performed on each instrument as specified by the manufacturer.

7.0 INTERNAL QUALITY CONTROL

7.1 FIELD PROCEDURES

Control parameters of the field procedures consist of the same controls that govern analytical data. These parameters are controlled through the assessment of data by precision, accuracy, representativeness, and completeness. Control parameters consist of the following:

- Collection of field and quality control samples;
- Calibration of field equipment in accordance with the manufacturer's standards
- Decontamination of field equipment; and
- Strict adherence to sampling protocol.

7.1.1 QC Samples

Assessment work at the site shall be completed in general accordance with the QAPP. Sampling efforts include the collection of groundwater, soil and air/vapor samples. Quality Control (QC) samples will be collected and analyzed for the purpose of assessing the quality of the sampling effort and the analytical data. The type, description, preparation and collection of QC samples are described below.

- Equipment Blank - Also called the Equipment Rinsate. A sample of analyte-free reagent water which has been used to rinse the sampling equipment. It is collected after completion of decontamination and prior to sampling at the next sample location. It is used to document adequate decontamination, i.e. that analytes from one sample location have not contaminated a sample from the next location.

- Field Blank - Analyte-free reagent water taken to the sampling site, transferred into a sample container on site and then analyzed by the laboratory for the same parameters as the investigative samples. This sample is used to check for procedural contamination of samples.

- Trip Blank - Trip blank is Type II Reagent Grade water, or better, that is kept with the field sample containers from the time they leave the laboratory until the time they are returned to the laboratory. The purpose of the trip blank is to evaluate possible cross-contamination of samples during transit or sample collection, primarily VOCs. A VOC trip blank will be included with each shipment of VOC samples.

- Field Replicates - Also called field duplicates. Independent samples which are collected from the same location or source, as closely as possible to the same point in space and time. They are stored in separate containers and analyzed separately for the purpose of documenting the precision of the sampling process. (Laboratory variability will also be introduced into the samples' results).

- Matrix Spike/Matrix Spike Duplicate - Spike Duplicate Investigative sample(s) which (for each applicable analytical parameters for that sample matrix) is split by the laboratory, spiked with target analytes for that analytical procedure, and analyzed with the other samples of that matrix.

The following will be collected as part of the ongoing sampling activities for the Site

- One equipment blank (or field blank if dedicated equipment is used) will be collected per day during groundwater sampling activity or each use of alternate equipment on the same media (i.e., pump or bailer use during sampling). Groundwater samples are scheduled to be collected with dedicated disposable tubing and bailers as described in Section 2.0. A single equipment blank will be collected from the source of tubing and bailers to evaluate possible contamination from the tubing or bailer. No other equipment rinse blanks are planned.

- One field blank per each round of groundwater monitoring will be submitted to the laboratory and analyzed for the same parameters as the monitoring well samples.

- One trip blank for each shipping container containing VOC samples will be analyzed for VOCs.

- One field replicate for every 20 soil and/or groundwater sample locations (or 5%) will be analyzed for the same parameters as the soil and groundwater samples.

- One field replicate for every 20 air/vapor sample locations (or 5%) will be analyzed for the same parameters as the air/vapor samples.

- One matrix spike (MS)/matrix spike duplicate (MSD) sample set will be analyzed for every 20 soil and/or groundwater sample locations (or 5%).

- The laboratory will run a method (preparation) blank in association with each sample preparation batch. For VOC samples, a blank will be run at the beginning of each analytical sequence following instrument calibration standards. Additional VOC blanks will be run after samples with high concentrations of target compounds to demonstrate that the instrument is free of contamination that might carry over from a contaminated instrument system.

- Upon initiation of an analytical run, the laboratory will perform calibration procedures as instructed by the analytical method(s) used and, where applicable, according to instrument manufacturer specifications. During the length of the run, continuing calibrations will be performed at the frequency specified. Where applicable, calibration blanks will be included in the calibration procedure.

- Surrogate standards will be added to all samples for organic analysis (VOCs). Surrogate recovery will be used to assess accuracy of organic analyses.

- Accuracy of inorganic analysis will be assessed by the percent recovery of spiked analytes.

- At a minimum, precision will be estimated by calculating the RPD between MS and MSD samples and the RPD between duplicate samples. The RPDs will be compared to the National Functional Data Validation Guidelines of 30 for water samples.

- Sample chain-of-custody will be maintained and documented. Copies of the chain-of-custody sheets will be submitted with the data sheets.

- The laboratory will use control limits outlined in the analytic method or developed in accordance with analytical methods. Additional quality control limits are established for the project for use in data validation and quality assessments as described in Section 8.6.

7.1.2 Decontamination and Disposal of Investigation Derived Waste

A decontamination area will be established for implementation of equipment decontamination and containment of spent rinse fluids. The location of the decontamination area will be selected based on the following criteria:

- Proximity to an adequate source of control water
- Distance from areas designated for environmental assessment
- Centralization to minimize spread of potential contamination during transportation

Equipment that comes in direct contact with a sample or portion of sample that will undergo chemical analyses or physical testing is defined as sample-contacting equipment. Examples of sample-contacting equipment include groundwater well bailers, split-barrel soil samplers, hand augers, stainless steel soil sampling equipment, and Geoprobe sampling equipment. Soil samples are not planned for this investigation and dedicated tubing or disposable bailers will be used to sample the monitoring wells; therefore, the need to decontamination of sampling equipment is not expected. If needed, the procedures used to decontaminate other sample-contacting equipment will be as follows:

- Wash with non-phosphatic soap solution using a brush made of inert material to remove any particles or surface film.

- Rinse thoroughly with control water (potable water is a convenient source of control rinse water).

- Rinse with distilled or de-ionized water.

- Allow equipment to air dry prior to next use.

Related equipment associated with the sampling effort that does not come in direct contact with a sample or portion of sample that will undergo chemical analyses or physical testing is defined as non-sample-contacting equipment. Examples of non-sample-contacting equipment include hollow stem augers, AW rod, drill stems and excavation machinery. The minimum procedure necessary to decontaminate non-sample-contacting equipment is either:

- Clean with potable water using a portable power washer or steam cleaning machine, or,
- Wash with non-phosphatic soap solution using a brush.

Spent rinse fluids generated during equipment decontamination will be contained in 55 gallon drums, larger totes, and/or bulk poly tanks. The containers will be labeled, temporarily stored and prepared for shipment (disposal). Spent rinse fluids placed in large bulk tanks will be pumped out by a licensed waste hauler for offsite disposal into a licensed/permitted disposal facility.

Investigation derived waste (IDW) material (well purge water, soil cuttings, development fluids, decontamination liquids and solids) will be containerized in approved containers during drilling and sampling activities. The IDW will be stored in a staging area on site. IDW material will be disposed of in accordance with local, state, and federal regulations. Characterization of IDW for disposal will be based on the following:

- Known history (knowledge of process) of the area from which the IDW was generated
- Current and previous assessment results
- Requirements of the receiving waste disposal facility and RCRA Characteristics testing (as required), typically reactivity, corrosivity, ignitability and toxicity

7.2 LABORATORY PROCEDURES

Laboratory internal quality control procedures are discussed in the laboratory quality assurance manuals.

7.3 ACCURACY AND PRECISION

Accuracy is a measurement of bias that exists in a measurement system. Accuracy represents the difference between the measured value and the true value for the measured parameter of interest. Errors as they pertain to accuracy may result from several sources including: the sampling processes, field contamination, improper preservation, handling of samples, sample matrix biases and analytical procedures. The accuracy of the sampling procedures and analytical data will be assessed by examining the results of blanks (including trip and field blanks), method specified QC samples, and through equipment calibration and verification.

Precision is a measure of the reproducibility of measurements taken under a given set of conditions. It is a quantitative measurement of the variability of a group of measurements compared to their average value. Precision is commonly assessed by evaluating relative percent difference between field duplicates, lab duplicates, and spike duplicates. Project-specific goals for precision are discussed in Section 8.0.

8.0 DATA REDUCTION, VALIDATION AND REPORTING

This section describes the procedures to be followed for data management, reduction, validation, and reporting.

8.1 DATA MANAGEMENT

Before the laboratory submits a complete laboratory data package, the data generated by a set of samples shall be tracked and collected in accordance with the subcontracted laboratory's quality assurance program.

8.2 DATA QUALITY ASSESSMENT

The data generated by the laboratory are assessed from sample receipt to the data report. The assessment consists of the following:

- Evaluation of sample analysis completeness
- Evaluation of quality control
- Determinations of detection limits

The evaluation of sample analysis completeness is initially determined by the laboratory. The laboratory quality control evaluation involves the examination of holding times, method blanks, laboratory control samples, matrix spike samples, and matrix spike duplicate samples compared to laboratory-established control limits. If data exceed these limits, they are qualified as to their usability.

The laboratory manager or designated personnel shall review all data generated by the laboratory. This review considers the following:

- Sample analysis completeness
- Evaluation of holding times
- Evaluation of quality control
- Establishment of detection limits
- Field record completeness
- Sampling collection procedures
- Identification of valid samples
- Identification of valid field test data
- Sample holding times

- Laboratory data QA/QC
- Calculations

After review of the data, the laboratory will submit its report to AMEC's Project Manager. All data are then reviewed to see that project-specific Quality Assurance (QA) goals are met as described in Section 8.6.

8.3 DATA REDUCTION

The majority of data reduction at the laboratory is performed by the data station associated with that particular piece of equipment. Data from computerized data stations are transferred into the laboratory data management system. Laboratory reports are prepared from the data system and are subject to an internal review at the laboratory. When all reviews are completed at the laboratory, a final laboratory report is produced and an electronic data deliverable (EDD) is prepared with the final data. The format of the EDD is provided on Table 5. The EDDs are provided to AMEC and electronic results are entered into the project database. Electronic results are reviewed during the independent data validation process described in Section 8.6.

8.4 LABORATORY DATA REVIEW

Data validation is the examination of data to determine data quality. Data validation will be performed internally by the laboratory as specified in the subcontracted laboratory's quality assurance manual.

8.4.1 First Level Review, the Analyst

The analyst's primary responsibilities are the calibration of the instruments, incorporation of the required QC samples, and sample analysis.

The analyst has the important role of ensuring the instrument is calibrated prior to starting the analysis of any particular batch of samples. The analyst will ensure that the sensitivity responses of each instrument are performing satisfactorily. The analyst will ensure that the system is stable and that any interferences have been minimized or eliminated. Additionally, the analyst will check to ensure that there is no unacceptable high background response due to any reagents used in the analytical process. Once the analyst has ensured that the instrument has been calibrated and is responding in the appropriate manner, the analyst will proceed to complete the analysis of samples.

The analyst's responsibilities will include the exercising of his own expertise and the Supervisor's if necessary, in evaluating the data generated with each batch of samples, as well as the QA parameters using the project. The analyst will submit the data to his Supervisor.

8.4.2 Second Level Review, the Supervisor

The Supervisor of each section will be responsible for reviewing on a daily basis all data generated by analysts within his/her section. The review of the quality associated with each set of data will be of a more rigorous nature. The Supervisor and/or Laboratory Manager will review the QA data to verify that the results are within the prescribed limits.

Only under extraordinary circumstances will the Laboratory Manager allow the acceptance of a set of data from duplicates or spike determination beyond the project QA limits. All data associated with out-of-control QA/QC samples will be flagged, and a corrective action report will be generated for review by the QA/QC Coordinator and Laboratory Manager. The QA/QC Coordinator and Laboratory Manager may require that the analysis be repeated.

8.4.3 Third Level Review, the QA/QC Coordinator

The QA/QC Coordinator will review a portion of all preliminary sample and QC data. The review will consist of the following:

- Verifying analysis system performance and calibration acceptability.
- Verifying sample results by tracing the final number back to the raw data;
- Verifying the QC data has met project QC frequency and control limits or, if the requirements were not met, verifying that documentation is present explaining why the data were accepted and verify that the data were flagged to signify and out-of-control situation;
- Verify that sample holding times meet requirements;
- Verify that samples were analyzed using methods specified in the QAPP; and
- Verify that the proper chain-of-custody procedures were documented.

Preliminary data may be presented to the client by the Laboratory Manager, before the final data report is sent to the client.

8.5 DATA REPORTING

All final reduced data for samples analyzed will be reported in the units appropriate for that type of analysis. All soil and sediment data will be reported on a dry-weight basis. All sludge data will be reported on a wet-weight basis unless specified by EPA protocol for dry weight basis. The following Data Quality Objectives (DQO's) levels of reporting are as follows:

8.5.1 Organics

Level I - Field screening, Verbal results
Level II - Labworks results (Data only/No QC)
Level III - CLP Forms 1-14, Prep sheets, Chain-of-custody forms
Level IV - Level III, Raw data, Runlogs, CLP diskette format B, Extended quants (GC/MS)
Levels V - Level IV, plus all methods not included in CLP

The level of DQO analytical support for groundwater monitoring, vapor and air samples will be Level IV.

8.6 DATA VALIDATION

Data validation independent of the laboratory review will be completed by the AMEC under direction of the QA/QC Manager. Data validation will be completed for groundwater VOCs only. The sample data from the other methods are presented in tables as reported by the laboratories. The data validation activity includes an assessment of chemistry data that is independent of the laboratory. It includes a review of all major QC checks completed during the sample analyses, and it includes verification of results of a subset of the data using raw instrument data and notebook records provided in the data deliverable packages. Data validation will be completed using general EPA guidelines (USEPA, 1999) and data validation and data review guidelines described in RISC Technical Guide – Appendix 2 (IDEM, 2001). Project specific QA/QC goals are identified in Table 6 for this project based on criteria contained in Performance and Presentation of Analytical Chemistry Data (IDEM, 1998) and the judgment of the AMEC project chemist. If necessary, data qualifiers will be added to the results to indicate data usability.

A full data validation including calculation checks and raw data verification will be completed on 10 percent of the data. Full validation will include a review and assessment of the following parameters:

- laboratory narrative;
- sample chain of custody/sample receipt records;

- sample preservation;
- instrument tuning and calibration;
- QC Blanks;
- laboratory control sample results;
- MS/MSD sample results;
- surrogate recovery;
- internal standard recovery and retention times;
- field replicate results;
- instrument logbooks;
- sample results summary;
- instrument data (chromatograms and quantitation reports);
- mass spectra for all target compounds identified by the data processor;
- verification of calculations and results reported on QC summary forms; and,
- verification of electronic database results.

If no major calculation or data reporting errors are observed during the full data validation, a reduced Level II type validation will be completed on the remaining 90% of the data. During the Level II validation the major QA/QC indicators of data quality will be reviewed, but review of calculations and raw laboratory data will not be included. QC data checks will be completed using QC summary forms provided in the laboratory packages. The following parameters are check during the Level II review:

- laboratory narrative;
- sample chain of custody/sample receipt records;
- sample preservation;
- QC Blanks;
- laboratory control sample results;
- MS/MSD sample results;
- surrogate recovery;
- internal standard recovery and retention times;
- field replicate results;
- sample results summary; and,
- verification of electronic database results.

A final data validation report will be prepared for each data set. The final validation report will be reviewed by the AMEC QA/QC Manger prior to issuing the final report. The data validation report will include the following:

- Introduction that documents analytical laboratories and procedures;
- A description or data validation procedures;
- A summary of data validation observations and data qualification actions; and,
- A complete tabulated summary of final sample results.

9.0 PERFORMANCE AND SYSTEM AUDITS

Implementation of field sampling activities will be the responsibility of the Project Manager and the Field Leaders. They will be responsible for implementing activities documented the Work Plan and QAPP and ensure that project-specific training of field personnel and subcontractors on the project objectives described in these documents. Copies of the Work Plan and QAPP will be available in the field as reference documents. No formal performance or system audits are scheduled.

During execution of the field investigations, the Project Manager and/or Field Leaders will initially review all aspects of field procedures, field measurement collection, sample collection, and project documentation processes to verify that procedures in the Work Plan and QAPP are followed. At a minimum the following field activities will be reviewed and assessed:

- Exploration and Sampling Procedures
- Field documentation practices
- Sample custody procedures
- Sample collection and preservation
- Sample identification processes
- Analytical methodologies
- Compliance with sample collection objectives

No formal audits are planned for the subcontract laboratories. Our subcontract laboratories participates in systems audits by federal and state agencies.

Oversight of all project activities will be carried out by the Project Manager to evaluate sampling activities, such as sample identification, sample control, chain-of-custody procedures, field documentation, and general sampling operations.

Data validation processes will be supervised and reviewed by the AMEC QA/QC Manager including providing project requirements to data validators, technical oversight of validation activities, and final review and approval of data validation reports.

10.0 PREVENTIVE MAINTENANCE

Preventive maintenance of field and laboratory equipment will include routine procedures to be carried out with each use, routine procedures to be carried out at scheduled intervals, and procedures to be carried out on an as needed basis. The need for equipment maintenance will be determined by the Project Manager and the field team leaders. AMEC maintains bound logbooks in which all scheduled and unscheduled maintenance is recorded in detail.

11.0 PROCEDURES TO ASSESS DATA PRECISION ACCURACY, AND COMPLETENESS

AMEC will provide an Annual Remediation Status Report after the completion of the first year of injections. This report will summarize results of the remediation and make interpretations on conditions at the Site. Analytical data quality evaluations will be provided in data validation reports that summarize the data validation task described in Section 8.6. These reports contain the following information:

- description of field investigation activities (objectives, maps, sample locations, sampling procedures, analytical testing)
- presentation of field records and field measurement
- presentation of laboratory analytical results
- data qualify assessment of laboratory analytical data precision, accuracy, and completeness
- contamination assessments and interpretations of site conditions

12.0 CORRECTIVE ACTIONS

Should a non conformance in field procedures occur during the implementation of this QAPP the following corrective actions will be implemented:

- Identification of the problem;
- Investigation of the problem;
- Determining the cause of the problem and appropriate corrective action;
- Implementing the corrective action; and,
- Verifying the problem has been corrected.

Once a situation has been identified as requiring a corrective action, documentation and establishment of control becomes necessary. At a minimum, documentation includes the following information:

- Originator of the corrective action and date
- Involvement of the Project Manager or Field Leader and date
- Description of the problem (by the originator)
- Cause of the problem (by the originator and/or supervisor)
- Outline of the corrective action including responsible parties and dates
- Follow-up dates
- Description of follow-up and assessment of corrective action
- Assessment of impact to the project objectives

The staff member (originator) who recognizes the need for corrective action contacts the Field Leader or Project Manager and documents the problem and the date on which it occurred. This can be recorded in the field logbook or a memorandum. If necessary, the project QA/QC Manager will be consulted. A decision regarding the chosen corrective actions are then recorded. Once the problem is completely understood, the corrective action plan is completed. Corrective actions are documented in the field logbooks or in a separate memorandum. This information is provided to the AMEC project manager who will assess the impacts of the situation on the project execution.

13.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT AND REPORTING

The Annual Remediation Status Report and the data validation reports for analytical data are the two primary reports that are generated. The Annual Remediation Status Report and the data validation reports will be evaluated and submitted to Textron and IDEM for inclusion in the project file.

14.0 REFERENCES

AMEC, 2014. Remediation Work Plan, TORX Facility, Rochester, Indiana, 2014.

Indiana Department of Environmental Management (IDEM), 2001. RISC Technical Guide – Appendix 2, February 15, 2001.

Indiana Department of Environmental Management (IDEM), 1998. “Guidance to the Performance and Presentation of Analytical Chemistry Data”; IC-13-14-1-11.5; July 16, 1998.

Indiana Department of Environmental Management (IDEM), 2012. “Remediation Closure Guide”; Office of Land Quality; July 9, 2012.

Indiana Department of Environmental Management (IDEM), 2012. “Draft Vapor Intrusion Pilot Program Guidance”; April 26, 2006.

TABLES

Table 1
Method TO-15 Target Compounds and Detection Limit for Air
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Analyte	CAS#	Molecular Weight	MDL	PQL	Units
1,1,1-Trichloroethane	71-55-6	133.4033	0.44	2.7	µg/m3
1,1,2,2-Tetrachloroethane	79-34-5	167.849	0.48	3.4	µg/m3
1,1,2-Trichloroethane	79-00-5	133.404	0.33	2.7	µg/m3
1,1-Dichloroethane	75-34-3	98.959	0.32	2	µg/m3
1,1-Dichloroethene	75-35-4	96.943	0.28	2	µg/m3
1,2,4-Trichlorobenzene	120-82-1	181.447	0.89	3.7	µg/m3
1,2,4-Trimethylbenzene	95-63-6	120.19	0.2	2.5	µg/m3
1,2-Dibromoethane	106-93-4	187.861	0.31	3.8	µg/m3
1,2-Dichlorobenzene	95-50-1	147.0014	0.3	3	µg/m3
1,2-Dichloroethane	107-06-2	98.959	0.24	2	µg/m3
1,2-Dichloropropane	78-87-5	112.986	0.14	2.3	µg/m3
1,3,5-Trimethylbenzene	108-67-8	120.19	0.15	2.5	µg/m3
1,3-Butadiene	106-99-0	54.0904	0.11	1.1	µg/m3
1,3-Dichlorobenzene	541-73-1	147.0014	0.24	3	µg/m3
1,4-Dichlorobenzene	106-46-7	147.0014	0.3	3	µg/m3
1,4-Dioxane	123-91-1	88.1051	0.32	1.8	µg/m3
2-Butanone	78-93-3	72.1	0.24	1.5	µg/m3
2-Hexanone	591-78-6	100.1589	0.29	2	µg/m3
2-Propanol	67-63-0	60.095	0.49	2.5	µg/m3
4-Ethyltoluene	622-96-8	120.1916	0.25	2.5	µg/m3
4-Methyl-2-pentanone	108-10-1	100.1589	0.29	2	µg/m3
Acetone	67-64-1	58.08	0.45	2.4	µg/m3
Benzene	71-43-2	78.1118	0.16	1.6	µg/m3
Benzyl chloride	100-44-7	126.5853	0.21	2.6	µg/m3
Bromodichloromethane	75-27-4	163.8289	0.4	3.4	µg/m3
Bromoform	75-25-2	252.7309	0.72	5.2	µg/m3
Bromomethane	74-83-9	94.9387	0.16	1.9	µg/m3
Carbon disulfide	75-15-0	76.131	0.22	1.6	µg/m3
Carbon tetrachloride	56-23-5	153.823	0.31	3.1	µg/m3
Chlorobenzene	108-90-7	112.557	0.32	2.3	µg/m3
Chloroethane	75-00-3	64.514	0.32	1.3	µg/m3
Chloroform	67-66-3	119.3767	0.2	2.4	µg/m3
Chloromethane	74-87-3	50.4877	0.12	1	µg/m3
cis-1,2-Dichloroethene	156-59-2	96.943	0.2	2	µg/m3
cis-1,3-Dichloropropene	10061-01-5	110.9706	0.32	2.3	µg/m3

Table 1 (continued)
Method TO-15 Target Compounds and Detection Limit for Air
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Analyte	CAS#	Molecular Weight	MDL	PQL	Units
Cumene	98-82-8	120.1916	0.34	2.5	µg/m3
Cyclohexane	110-82-7	84.1595	0.17	1.7	µg/m3
Dibromochloromethane	124-48-1	208.2799	0.34	4.3	µg/m3
Dichlorodifluoromethane	75-71-8	120.9138	0.35	2.5	µg/m3
Ethyl acetate	141-78-6	88.106	0.4	1.8	µg/m3
Ethylbenzene	100-41-4	106.165	0.26	2.2	µg/m3
Freon 113	76-13-1	187.3762	0.54	3.8	µg/m3
Freon 114	76-14-2	170.92	0.35	3.5	µg/m3
Heptane	142-82-5	100.2019	0.33	2	µg/m3
Hexachlorobutadiene	87-68-3	260.761	1.7	5.3	µg/m3
Hexane	110-54-3	86.1754	0.21	1.8	µg/m3
m,p-Xylene	179601-23-1	106.167	0.35	2.2	µg/m3
Methylene chloride	75-09-2	84.9328	0.24	1.7	µg/m3
MTBE	1634-04-4	88.1492	0.18	1.8	µg/m3
Naphthalene	91-20-3	128.1705	0.47	2.6	µg/m3
o-Xylene	95-47-6	106.167	0.22	2.2	µg/m3
Propene	115-07-1	42.0804	0.17	0.86	µg/m3
Styrene	100-42-5	104.1491	0.17	2.1	µg/m3
Tetrachloroethene	127-18-4	165.8322	0.47	3.4	µg/m3
Tetrahydrofuran	109-99-9	72.11	0.35	1.5	µg/m3
Toluene	108-88-3	92.1384	0.15	1.9	µg/m3
trans-1,2-Dichloroethene	156-60-5	96.943	0.28	2	µg/m3
trans-1,3-Dichloropropene	10061-02-6	110.9706	0.27	2.3	µg/m3
Trichloroethene	79-01-6	131.388	0.32	1.1	µg/m3
Trichlorofluoromethane	75-69-4	137.3684	0.17	2.8	µg/m3
Vinyl acetate	108-05-4	86.0892	0.32	1.8	µg/m3
Vinyl chloride	75-01-4	62.498	0.13	1.3	µg/m3

Prepared By: ALS

Table 2
Method 8260 Target Compounds and Detection Limits for Concentrations in Groundwater
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Method	Analyte	CAS	Laboratory	MDL	PQL	Unit
VOC_8260_W	1,1,1-Trichloroethane	71-55-6	ALS	0.21	1	µg/L
VOC_8260_W	1,1,2,2-Tetrachloroethane	79-34-5	ALS	0.19	1	µg/L
VOC_8260_W	1,1,2-Trichloroethane	79-00-5	ALS	0.15	1	µg/L
VOC_8260_W	1,1-Dichloroethane	75-34-3	ALS	0.18	1	µg/L
VOC_8260_W	1,1-Dichloroethene	75-35-4	ALS	0.19	1	µg/L
VOC_8260_W	1,2-Dichloroethane	107-06-2	ALS	0.15	1	µg/L
VOC_8260_W	1,2-Dichloroethene, Total	540-59-0	ALS	0.35	2	µg/L
VOC_8260_W	1,2-Dichloropropane	78-87-5	ALS	0.14	2	µg/L
VOC_8260_W	1,3-Dichloropropene, Total	542-75-6	ALS	0.31	2	µg/L
VOC_8260_W	2-Butanone	78-93-3	ALS	0.35	5	µg/L
VOC_8260_W	2-Hexanone	591-78-6	ALS	0.23	5	µg/L
VOC_8260_W	4-Methyl-2-pentanone	108-10-1	ALS	0.33	5	µg/L
VOC_8260_W	Acetone	67-64-1	ALS	0.36	20	µg/L
VOC_8260_W	Benzene	71-43-2	ALS	0.17	1	µg/L
VOC_8260_W	Bromodichloromethane	75-27-4	ALS	0.14	1	µg/L
VOC_8260_W	Bromoform	75-25-2	ALS	0.12	1	µg/L
VOC_8260_W	Bromomethane	74-83-9	ALS	0.3	1	µg/L
VOC_8260_W	Carbon disulfide	75-15-0	ALS	0.1	2.5	µg/L
VOC_8260_W	Carbon tetrachloride	56-23-5	ALS	0.16	1	µg/L
VOC_8260_W	Chlorobenzene	108-90-7	ALS	0.14	1	µg/L
VOC_8260_W	Chloroethane	75-00-3	ALS	0.29	1	µg/L
VOC_8260_W	Chloroform	67-66-3	ALS	0.19	1	µg/L
VOC_8260_W	Chloromethane	74-87-3	ALS	0.33	1	µg/L
VOC_8260_W	cis-1,2-Dichloroethene	156-59-2	ALS	0.17	1	µg/L
VOC_8260_W	cis-1,3-Dichloropropene	10061-01-5	ALS	0.16	1	µg/L
VOC_8260_W	Dibromochloromethane	124-48-1	ALS	0.1	1	µg/L
VOC_8260_W	Ethylbenzene	100-41-4	ALS	0.15	1	µg/L
VOC_8260_W	m,p-Xylene	M/P-XYLENE	ALS	0.31	2	µg/L
VOC_8260_W	Methylene chloride	75-09-2	ALS	0.31	5	µg/L
VOC_8260_W	o-Xylene	95-47-6	ALS	0.16	1	µg/L
VOC_8260_W	Styrene	100-42-5	ALS	0.14	1	µg/L
VOC_8260_W	Tetrachloroethene	127-18-4	ALS	0.13	2	µg/L
VOC_8260_W	Toluene	108-88-3	ALS	0.14	1	µg/L
VOC_8260_W	trans-1,2-Dichloroethene	156-60-5	ALS	0.17	1	µg/L
VOC_8260_W	trans-1,3-Dichloropropene	10061-02-6	ALS	0.14	1	µg/L
VOC_8260_W	Trichloroethene	79-01-6	ALS	0.19	1	µg/L
VOC_8260_W	Vinyl chloride	75-01-4	ALS	0.27	1	µg/L
VOC_8260_W	Xylenes, Total	1330-20-7	ALS	0.48	2	µg/L

MDL = method detection limit
PQL = practical quantitation limit
µg/L = micrograms per Liter

Prepared By: RJC
Checked By: PJS

Table 3
Redox Target Compounds and Detection Limits for Concentrations in Groundwater
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Method	Analyte	Laboratory	MDL	PQL	Unit
Geochemistry Parameters					
SW9060	Total Organic Carbon	ALS	0.021	0.50	mg/L
A2320 B	Alkalinity (as $CaCO_3$)	ALS	1.68	12.0	mg/L
SW6020A	Iron	ALS	0.00005	0.5	mg/L
SW6020A	Manganese	ALS	0.00005	0.5	mg/L
SW9056	Nitrate	ALS	0.006	0.020	mg/L
SW9056	Sulfate	ALS	0.245	1.0	mg/L
SW9056	Chloride	ALS	0.065	1.0	mg/L
SW9030	Sulfide	ALS	0.776	1.0	mg/L
Volatile Fatty Acids					
IC by SOP AM23G	Acetic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Butyric Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Lactic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	n-Pentanoic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	i-Pentanoic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Propionic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	Pyruvic Acid	Microseeps	N/A	0.07	mg/L
IC by SOP AM23G	n-Hexanoic Acid	Microseeps	N/A	0.10	mg/L
IC by SOP AM23G	i-Hexanoic Acid	Microseeps	N/A	0.10	mg/L
Dissolved Gases					
AM20GAX	Methane	Microseeps	N/A	0.100	µg/L
AM20GAX	Ethane	Microseeps	N/A	0.025	µg/L
AM20GAX	Ethene	Microseeps	N/A	0.025	µg/L
Dehalococcoides (DHC) and Functional Genes					
qPCR	Total DHC	Microbrial Insights	N/A	1	c/mL
qPCR	TCE Reductase (tceA)	Microbrial Insights	N/A	1	c/mL
qPCR	Vinyl Chloride Reductase (bvcA)	Microbrial Insights	N/A	1	c/mL
qPCR	Vinyl Chloride Reductase (vcrA)	Microbrial Insights	N/A	1	c/mL

qPCR = quantitative polymerase chain reaction
MDL = method detection Limit
PQL = practical quantitation Limit
c/mL = cells per milliliter
µg/L = micrograms per Liter
mg/L = miligrams per Liter
IC = ion chromatogaphy

Prepared By: RJC
Checked By: PJS

Table 4
Summary Sample Collection Specifications
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Analytical Group	Matrix	Method	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum (preparation/ analysis)
VOCs	GW	SW-846 8260B	3 x 40 ml	3 x 40 ml VOA vials	No headspace; Cool, 4ºC	7 days to analysis
VOCs	SO	SW-846 5035A / 8260C	3 x 40ml and (1) 2oz jar for % solids	3 x 40ml (2 with DI water, 1 with methanol)	Low-Conc: 5 ml sodium bisulfate/water with stir bar, 4ºC. High-Conc: 10 ml methanol, 4ºC.	14 days to analysis
VOCs	AIR	Compendium Method TO-15/ L-12	1 x 6 L	1 x 6L Summa canister	Ambient temperature	30 days to analysis
Total Organic Carbon (TOC)	GW	SW-846 9060	1 x 100mL	1 x 100mL, polyethylene or glass	Cool, 4ºC	28 days
Alkalinity	GW	SM 2320 B	1 x 100mL	1 x 100mL, polyethylene	Cool, 4ºC	14 days
Metals (Mn)	GW	SW-846 6020A	1 x 500mL	1 x 500mL, polyethylene	pH < 2 w/ HNO_3; Cool, 4ºC	180 days to analysis
Anions (NO3, SO4, CL)	GW	SW-846 9056	1 x 500mL	1 x 500mL, polyethylene	Cool, 4ºC	28 days (SO4, CL) 48 hours (NO3)
Anions (NO3/NO2)	GW	SW-846 9056	1 x 200mL	1 x 200mL, polyethylene	pH < 2 w/ H2SO4, Cool, 4ºC	28 days (SO4, CL) 48 hours (NO3)
Sufide	GW	SW-846 9030	1 x 500mL	1 x 500mL, polyethylene	zinc acetate, Cool, 4ºC	7 days
Volatile Fatty Acids	GW	IC by SOP AM23G	2 x 40 ml VOA vials	2 x 40 ml VOA vials	Benzalkonium Chloride, No headspace; Cool, 4ºC	14 days
Dissolved Gases	GW	AM20GAX	2 x 40 ml VOA vials	2 x 40 ml VOA vials	Tri-Sodium Phosphate, No headspace; Cool, 4ºC	14 days
Dehalococcoides (DHC)	GW	qPCR	2 x 1 L	2 x 1 L, polyethylene	Cool, 4ºC	48 hour

Prepared By: CSR
Checked By: PJS

Table 5
Electronic Data Deliverable Format
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

Equis "EZEDD01" Field Name	data type	Required For "EDD"	Description	"TED" Table	"TED" Column
project_code	1 Text20	X	This field contains the internal project_code used by TED to identify a unique site. This will be provided to the lab on a per project basis.	Location	Site_id
sample_name	2 Text30	X	This field contains the sample number as written in the Analysis Request and Chain of Custody (AR/COC) form sent to the laboratory with the field samples for analysis. This is a unique number assigned to each sample by sampling personnel. For laboratory samples enter "LAB QC".	sample_collection	field_sample_id
sys_sample_code	3 Text20				
sample_date	4 Date	X	mm/dd/yyyy. Date sample was collected in the field. Date information must be identical with the date from the AR/COC form. Leave blank for lab samples. Year may be entered as yyyy.	sample_collection	field_sample_date
sample_time	5 Time				
analysis_location	6 Text2				
lab_name_code	7 Text10	X	Laboratory that performed the analysis.	sample_analysis	lab_id
lab_sample_id	8 Text20	X	Unique sample ID internally assigned by the laboratory.	sample_analysis	lab_sample_id
sample_type_code	9 Text10	X	Specifies sample type. For field samples, enter FS (regular environmental sample), otherwise, use values listed in the LOV. For example, normal field samples must be distinguished from laboratory method blank samples, etc.	sample_collection	qc_code
Lab_Del_Group	10 Text20	X	Tracking code used by the laboratory. Commonly called Sample Delivery Group (SDG).	sample_analysis	lab_sample_delivery_group
Lab_Batch_Number	11 Text20		Tracking number used by the laboratory to identify a group of samples analyzed in the same batch. This field, in conjunction with laboratory blank ID, is used to link the relationship between field samples and laboratory blank and other QC samples.		
lab_anl_method_name	12 Text35	X	Test method used in the analysis of the analyte.	sample_analysis	analysis_method
cas_rn	13 Text15	X	Unique analyte identifier. Use assigned CAS number when one is identified for an analyte. Tentatively Identified Compounds (TICs) and a number of other analytes are not assigned a standard CAS number. The laboratory is required to assign a UNIQUE identifier for all chemical_names.	sample_analysis_results	casno
chemical_name	14 Text60	X	Name of analyte or parameter analyzed.		
result_value	15 Text20	X	Must only be a numeric value. It is stored as a string of characters so that significant digits can be retained. Must be identical with values presented in the hard copy. Analytical result is reported left justified. Reported as the reporting_detection_limit for non-detects.	sample_analysis_results	lab_result
lab_qualifiers	16 Text7	X	Qualifier flags assigned by the laboratory.	sample_analysis_results	lab_qualifier
result_unit	17 Text15	X	This format assumes that the result value and detect limit have the same units.	sample_analysis_results	result_uom
result_type_code	18 Text10	X	Type of result (TIC, target analyte, etc.)	sample_analysis_results	result_type
detect_flag	19 Text2	X	Enter “Y” for detected analytes or “N” for non-detected analytes.	sample_analysis_results	report_hit_flag
reporting_detection_limit	20 Text20	X	Must only be a numeric value. Use the value of the Reported Detection Limit (RDL), Practical Quantitation Limit (PQL), or Contract Required Quantitation Limit. Value is stored as a string to retain significant figures. Unit of measure must be identical with result_unit value.	sample_analysis_results	detection_limit
dilution_factor	21 Text6	X	Must be a numeric entry. The factor by which the sample was diluted as part of the preparation process. If no dilution was done, enter the value 1. Value is stored as a string to retain significant figures.	sample_analysis	dilution_factor
sample_matrix_code	22 Text10	X	Code which distinguishes between different type of sample matrix. For example, soil samples must be distinguished from ground water samples, etc. Valid codes for HESE are "G" (gas), "L" (liquid), "S" (solid), and "P" (free or raw liquid product).	sample_collection	matrix
total_or_dissolved (or fraction)	23 Text1	X	Must be “T” for total metal concentration, “D” for dissolved or filtered metal concentration, or “N” for organic (or other) parameters for which neither “total” nor “dissolved” is applicable. Also, HESE requires "C" for TCLP and "S" for SPLP fractions.	sample_analysis	fraction
basis	24 Text10				
analysis_date	25 Date	X	mm/dd/yyyy. Date sample was analyzed.	sample_analysis	analysis_date
analysis_time	26 Time				
method_detection_limit	27 Text20				
lab_prep_method_name	28 Text35		Description of sample preparation or extraction method.	sample_analysis	prep_method_name
prep_date	29 Date	X	mm/dd/yyyy. This field is used to determine whether holding times for field samples have been exceeded.	sample_analysis	extraction_date
prep_time	30 Time				
test_batch_id	31 Text20				
result_error_delta	32 Text20				
TIC_retention_time	33 Text8				
qc_level	34 Text10		Laboratory QC level associated with the analysis	sample_analysis	qc_level
result_comment	35 Text255		Any comments related to the analysis.	sample_analysis_results	comments
sample_quantitation_limit (may be REQUIRED FIELD for certain projects)	36 Text20		Must only be a numeric value. Use the value of the Sample Quantitation Limit (SQL). Value is stored as a string to retain significant figures. Unit of measure must be identical with result_unit value.	sample_analysis_results	TBD

Note: All "X" marked fields are minimum data required to load data to "TED".

Prepared By: CSR
Checked By: PJS

Table 6
Summary of Project Analytical QC Limits for Data Validation
TORX Facility, 4366 North Old US Highway 31, Rochester, Indiana

PARAMETER	QC TEST	ANALYTE	WATER (% Recovery Limit)	WATER RPD	SOIL (% Recovery Limit)	SOIL RPD
Volatiles	**Surrogate**	All Surrogates(1)	85 - 115	---	80 - 120	---
	LCS	All Target Compounds	70 - 130	---	60 - 140	---
	MS/MSD	All Target Compounds	70 - 130	20	60 - 140	30
	Field Duplicates	All Target Compounds	---	25	---	40

Notes:

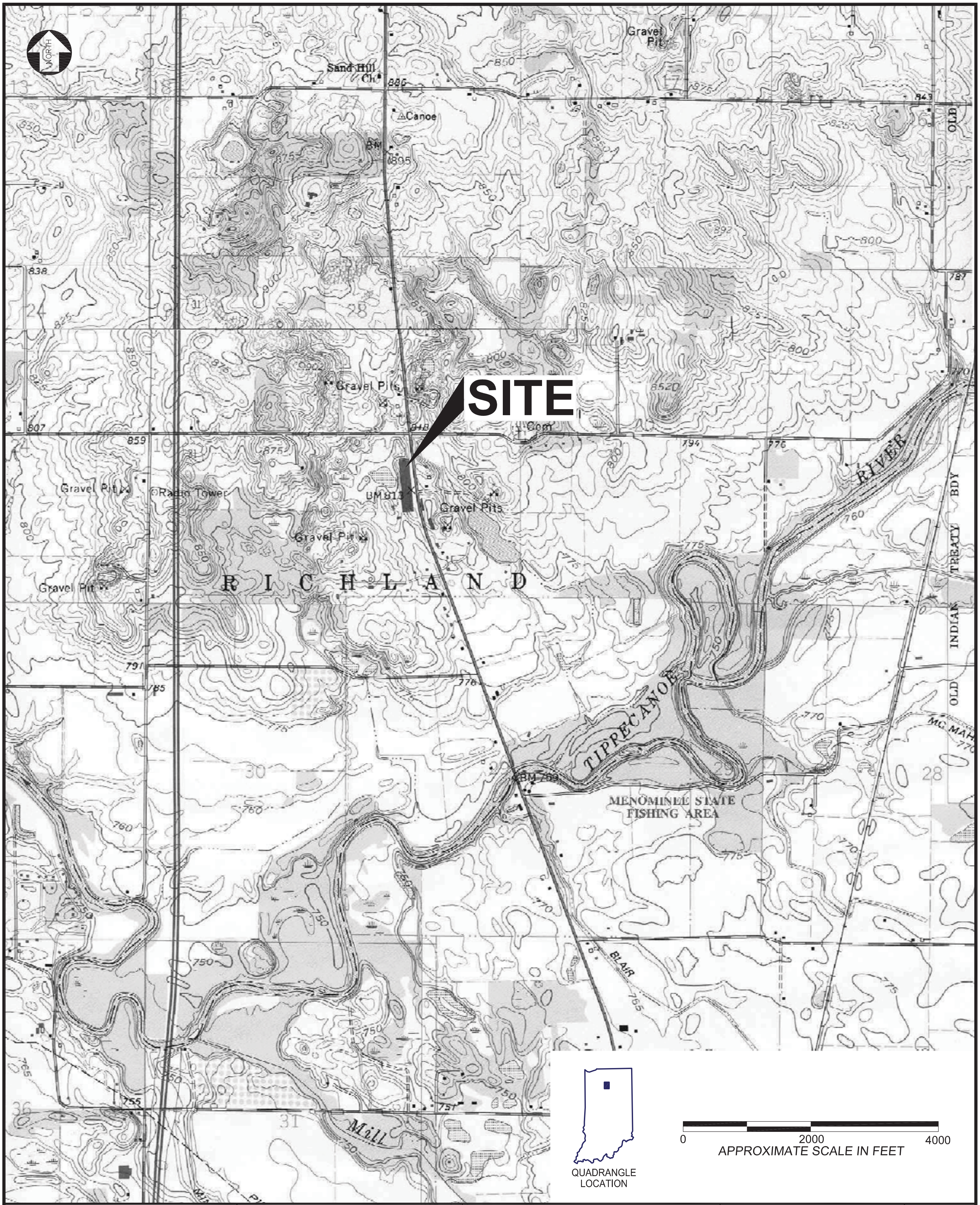
LCS - Laboratory Control Sample

MS/MSD - Matrix Spike/ Matrix Spike Duplicate

(1) Project-specific limits for surrogate recovery review/validation are established based on subcontract laboratory and Indiana Department of Environmental Management (IDEM) recommended control limits and the judgment of the project chemist. The project limits are used for evaluation of recovery for all surrogates during data validation.

Prepared By: CSR
Checked By: PJS

FIGURE



DRAWN BY RLB

FILE NO. P:\Textron\TFS\Drawings\TFS Topo.dwg

APPROVED BY

DATE 07/02/2012

SOURCE USGS topographic quadrangles of Argos, IN, 1994 and Rochester, IN, 1992.

PROJECT NO. 3359 11 2583

SCALE SEE ABOVE

TORX FACILITY
4366 NORTH OLD US HIGHWAY 31
ROCHESTER, INDIANA

amec

SITE LOCATION MAP

DRAWING NO. 1

SHEET 1 of 1

APPENDIX A

FIELD RECORD FORMS

☐ ALS Laboratory Group
10450 Stancliff Rd. #210
Houston, Texas 77099
(Tel) 281.530.5656
(Fax) 281.530.5887

Chain of Custody Form

Page **of**

☑ ALS Laboratory Group
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

ALS Project Manager:		**ALS Work Order #:**	

Customer Information		**Project Information**		**Parameter/Method Request for Analysis**	
Purchase Order		**Project Name**		**A**	**VOCs - USEPA Method 8260B**
Work Order		**Project Number**		**B**	**Anions: Nitrate, Sulfate, Chloride - Method SW9056**
Company Name		**Bill To Company**		**C**	**Manganese - Method SW6020A**
Send Report To		**Invoice Attn.**		**D**	**Organic Carbon, Total - Method SW9060**
Address		**Address**		**E**	**Alkalinity (as CaCO3) - Method A2320 B**
				F	**Metals, Dissolved (As,Cd,Ca,Cu,Se,Fe,Mg) - Method SW6010**
City/State/Zip		**City/State/Zip**		**G**	**Metals, Total (As,Cd,Ca,Cu,Se,Fe,Mg) - Method SW6010**
Phone		**Phone**		**H**	**Sulfide - Method SW9030**
Fax		**Fax**		**I**	**Iron - Method SW6010**
e-Mail Address				**J**	

No.	**Sample Description**	**Date**	**Time**	**Matrix**	**Pres. Key Numbers**	**# Bottles**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**Hold**
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign	**Shipment Method:**	**Required Turnaround Time: (Check Box)** ☐ Other __________ ☐ 10 Wk Days ☐ 5 Wk Days ☐ 3 Wk Days ☐ 2 Wk Days ☐ 24 Hour	**Results Due Date:**

Relinquished by:	**Date:**	**Time:**	**Received by:**	**Date:**	**Time:**	**Notes:**
Relinquished by:	**Date:**	**Time:**	**Received by (Laboratory):**	**Date:**	**Time:**	
Logged by (Laboratory):	**Date:**	**Time:**	**Checked by (Laboratory):**			

ALS Cooler ID	**Cooler Temp**	**QC Package: (Check Box Below)**	
		☐ Level II: Standard QC	☐ Level III: Raw Data
		☐ TRRP LRC	☐ TRRP Level IV
		☐ Level IV: SW846 Methods/CLP like	
		☐ Other: ____________________	

Preservative Key: **1-**HCl **2-**HNO_3 **3-**H_2SO_4 **4-**NaOH **5-**$Na_2S_2O_3$ **6-**$NaHSO_4$ **7-**Other **8-**4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.

☑ ALS Laboratory Group
4388 Glendale-Milford Road
Cincinnati, Ohio 45242
(Tel) 513.733.5336
(Fax) 513.733.5347

Chain of Custody Form

Page ______ **of** _______

☐ ALS Laboratory Group
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

ALS Project Manager:	Ben Dressman	**ALS Work Order #:**	

Customer Information		**Project Information**		**Parameter/Method Request for Analysis**	
Purchase Order		**Project Name**		**A**	**VOCs Method TO-15**
Work Order		**Project Number**		**B**	**Initial Vacuum (Inches of Hg)**
Company Name		**Bill To Company**		**C**	**Ending Vacuum (Inches of Hg)**
Send Report To		**Invoice Attn.**		**D**	**Summa Canister ID Number**
Address		**Address**		**E**	**Flow Regulator ID Number**
				F	
City/State/Zip		**City/State/Zip**			
Phone		**Phone**			
Fax		**Fax**			
e-Mail Address					

No.	**Sample ID**	**Date** **Start** **Stop**	**Time** **Start** **Stop**	**Matrix**	**Pres. Key Numbers**	**# Containers**	**A**	**B**	**C**	**D**	**E**	**F**	**Hold**
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

Sampler(s): Please Print & Sign	**Shipment Method:**	**Required Turnaround Time: (Check Box)** ☐ 10 Wk Days ☐ 5 Wk Days ☐ 3 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ___________	**Results Due Date:**

Relinquished by:	**Date:**	**Time:**	**Received by:**	**Date:**	**Time:**	**Notes:** ALS Quote ID: 3526
Relinquished by:	**Date:**	**Time:**	**Received by (Laboratory):**	**Date:**	**Time:**	
Logged by (Laboratory):	**Date:**	**Time:**	**Checked by (Laboratory):**			

ALS Cooler ID	**Cooler Temp**	**QC Package: (Check Box Below)**	
		☐ Level II: Standard QC	☐ Level III: Raw Data
		☐ TRRP LRC	☑ TRRP Level IV
		☐ Level IV: SW846 Methods/CLP like	
		☐ Other: ______________________	

Preservative Key: **1**-HCl **2**-HNO_3 **3**-H_2SO_4 **4**-NaOH **5**-$Na_2S_2O_3$ **6**-$NaHSO_4$ **7**-Other **8**-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.

AIR AND SOIL VAPOR SAMPLING RECORD

Project Name:	Client:	Location ID:
Project Number:	Collector:	Date:

SUMMA Canister Record Information:

SUBSLAB SOIL VAPOR SAMPLE		INDOOR AIR - BASEMENT		INDOOR AIR - FIRST FLOOR		ASSOCIATED AMBIENT	
Canister Volume (L)		Canister Volume (L)		Canister Volume (L)		Canister Volume (L)	
Flow Regulator No:		Flow Regulator No:		Flow Regulator No:		Flow Regulator No:	
Flow Rate (mL/min):		Flow Rate (mL/min):		Flow Rate (mL/min):		Flow Rate (mL/min):	
Canister Serial No:		Canister Serial No:		Canister Serial No:		Canister Serial No:	
Start Date/Time:		Start Date/Time:		Start Date/Time:		Start Date/Time:	
Start Pressure ("Hg):		Start Pressure ("Hg):		Start Pressure ("Hg):		Start Pressure ("Hg):	
Stop Date/Time:		Stop Date/Time:		Stop Date/Time:		Stop Date/Time:	
Stop Pressure ("Hg):		Stop Pressure ("Hg):		Stop Pressure ("Hg):		Stop Pressure ("Hg):	
Sample ID:		Sample ID:		Sample ID:		Sample ID:	

Other Sampling Information:

Finished Basement, Crawl Space, Unfinished Basement		Story/Level:		Story/Level:		Direction from Building:	
Floor Slab Thickness:		Room:		Room:		Distance from Building:	
Potential Vapor Entry Points:		Potential Vapor Entry Points:		Potential Vapor Entry Points:		Distance from Roadway:	
Floor Surface:		Floor Surface:		Floor Surface:		Ground Surface:	
Noticable Odor:		Noticable Odor:		Noticable Odor:		Noticable Odor:	
PID Reading (ppb):		PID Reading (ppb):		PID Reading (ppb):		PID Reading (ppb):	
Intake Depth/Height:		Intake Height:		Intake Height:		Intake Height Above Ground Surface:	
Helium Test Conducted? Breakthrough %:		Indoor Air Temp:		Indoor Air Temp:		Intake Tubing Used?	

Comments/Location Sketch:

amec

Signature:______________________________

521 Byers Road, Suite 204, Miamisburg, OH 45342

INDOOR AIR BUILDING SURVEY CHECKLIST

Preparer's Name: ________________________ Date: ___________________________

Preparer's Affiliation: ______________________ Phone #: ______________________

Site Name: _____________________________ Site # ________________________

Site Address (include city and zip):____

Part I – Occupants

List of Current Occupants/Occupation (include children)

Name (Age)	Address: (Lot # or apt. #)	Sex (M/F)	Occupation
John Doe (42)	112 South St. Lot # 12	M	geologist

Part II – Building Characteristics

Building type: residential / multi-family residential / office / strip mall / commercial / industrial / other

Describe building: ________________________________ Year constructed: _______________

Sensitive population: day care / nursing home / hospital / school / other (specify): ___________

Number of floors at or above grade: _______

Number of floors below grade: ________ (full basement / crawl space / slab on grade)

Depth of basement below grade surface: ______ ft. Basement size: ______ ft^2

Basement floor construction: concrete / dirt / slab / stone / other (specify): ________

Foundation walls: poured concrete / cinder blocks / stone / other (specify): ___________

Basement sump present? *Yes / No* Sump pump? *Yes / No* Water in sump? *Yes / No*

Significant cracks present in basement floor? *Yes / No*

Significant cracks present in basement walls? *Yes / No*

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? *Yes / No*

Is there a whole house fan? *Yes / No*

Septic system? *Yes / Yes (but not used) / No*

Irrigation/private well? *Yes / Yes (but not used) / No*

Type of ground cover outside of building: grass / concrete / asphalt / other (specify) _________

Sub-slab vapor/moisture barrier in place? *Yes / No / Don't know*
Type of barrier: _________________________

Type of heating system (circle all that apply):
hot air circulation
hot air radiation
wood
steam radiation
heat pump
hot water radiation
kerosene heater
electric baseboard
other (specify): ______________________

Type or ventilation system (circle all that apply):
central air conditioning
mechanical fans
bathroom ventilation fans
individual air conditioning units
kitchen range hood fan
outside air intake
other (specify): _________________

Type of fuel utilized (circle all that apply):
Natural gas / electric / fuel oil / wood / coal / solar / kerosene / other (specify):_________

Part III – Outside Contaminant Sources

Contaminated site within 50-ft (BTEX) or 100-ft (Chlorinated)? ____________________

If yes: Site Name: ________________ Site Number:_________________________

Other stationary sources nearby (gas stations, emission stacks, etc.): _______________________

Heavy vehicular traffic nearby (or other mobile sources): _______________________________

Part IV – Indoor Contaminant Sources

Identify all potential indoor sources found in the building (including attached garages), the location of the source (floor & room), and whether the item was removed from the building 48 hours prior to the indoor air sampling event. Any ventilation implemented after removal of the items should be completed at least 24 hours prior to the start of the indoor air sampling event.

Potential Sources	**Location (s)**	**Removed** (Yes / No / NA)
Gasoline storage cans		
Gas-powered equipment (mowers, etc)		
Kerosene storage cans		
Paints / thinners / strippers		
Cleaning solvents		
Oven cleaners		
Carpet / upholstery cleaners		
Other house cleaning products		
Moth balls		
Polishes / waxes		
Insecticides		
Furniture / floor remover		
Nail polish / polish remover		
Hairspray		
Cologne / perfume		
Air fresheners		
Fuel tank (inside building)		NA
Wood stove or fireplace		NA
New Furniture / upholstery		
New carpeting / flooring		NA
Hobbies – glues, paints, lacquers, photographic darkroom chemicals, etc		
Scented trees, wreaths, potpourri, etc.		
Other (specify):		

Part V – Miscellaneous Items

Do any occupants of the building smoke? *Yes / No* How often? _______________

Last time someone smoked in the building? __________________ hours / days ago

Does the building have an attached garage directly connected to living space? *Yes / No*

If so, is a car usually parked in the garage? *Yes / No*

Are gas-powered equipment or cans of gasoline/fuels stored in the garage? *Yes / No*

Do the occupants of the building have their clothes dry cleaned? *Yes / No*

If yes, how often? Weekly / monthly / 3-4 times a year

When was the last dry cleaned garment brought home? ________________

Do any of the occupants use solvents in work? *Yes / No*

If yes, what types of solvents are used? ___________________________________

If yes, are their clothes washed at work? *Yes / No*

Have any pesticides/herbicides been applied around the building or in the yard? *Yes / No*

If so, when and which chemicals? ____

Has there ever been a fire in the building? *Yes / No* If yes, when? ____________

Has painting or staining been done in the building in the last 6 months? *Yes / No*

If yes, when? _______________ and where? __________________________

Part VI – Sampling Information

Company/Consultant: _____________________________ Phone number: ( ) ____ - _______

Sample Source: Indoor Air / Sub-Slab / Near Slab Soil Gas / Exterior Soil Gas

Sampler Type: 400 mL – 1.0 L Summa Canister / 6 L Summa Canister / Other
(specify): ______________________

Analytical Method: TO-14A / TO-15 / TO-15 SIM / other: __________

Laboratory: ___________________________

Sample locations (floor, room):

Field/Sample ID# _________________________ Field/Sample ID # ____________________

Field/Sample ID# _________________________ Field/Sample ID # ____________________

Field/Sample ID# _________________________ Field/Sample ID # ____________________

Were "Instructions for Occupants" followed? *Yes / No*

If not, describe modifications: ____

Provide Drawing of Sample Location (s) in Building

Part VII – Metrological Conditions

Was there significant precipitation within 12 hours prior to (or during) the sampling event?
Yes / No

Describe the general weather conditions: ____

____

Part VIII – General Observations

Provide any information that may be pertinent to the sampling event and may assist in the data interpretation process.

____

____

____

Recommended Instructions for Residents

The following is a suggested list for residents to follow (to the extent practical) in order to reduce interference in obtaining representative samples. IDEM suggests that these items be followed starting at least 48 hours prior to and during the sampling event.

- Do not open windows, fireplace opening or vents
- Do not keep doors open.
- Do not operate ventilation fans.
- Do not use air fresheners or odor eliminators.
- Do not smoke in the house to the extent practical.
- Do not use wood stoves, fireplace or auxiliary heating equipment (e.g., kerosene heater)
- Do not use paints or varnishes.
- Do not use cleaning products (e.g., bathroom cleaners, furniture polish, appliance cleaners, and floor cleaners).
- Do not use cosmetics, including hair spray, nail polish, nail polish remover, perfume, etc.
- Do not partake in indoor hobbies that use solvents.
- Do not apply pesticides.
- Do not store containers of gasoline, oil or petroleum-based or other solvents within the house or attached garage (except for fuel oil tanks).
- Do not operate or store automobiles in an attached garage.

APPENDIX B

SUBCONTRACT LABORATORIES QUALITY ASSURANCE MANUALS

ALS Laboratory Group

Microseeps Laboratory

Microbial Insights

ALS Environmental

QUALITY ASSURANCE MANUAL

ALS Laboratory Group, Environmental Division

Cincinnati Facility

4388 Glendale-Milford Rd.

Cincinnati, OH 45242

513-733-5336 (T)

513-733-5347 (F)

www.alsglobal.com

ALS Laboratory Group
ENVIRONMENTAL CHEMISTRY QUALITY ASSURANCE PROGRAM PLAN

Revision 17- 9/16/13

This quality manual covers the following organizational units-
Gas Chromatography, Gas Chromatography/Mass Spectroscopy, Liquid Chromatography, Spectroscopy, and Wet Chemistry.

Jeffrey A. Ogle, B.S.
Laboratory Director

9/11/13
Date

Tracey Earle
Tracey A. Earle, B.S., M.B.A., M.S.
Quality Assurance Manager

9/16/13
Date

ALS Laboratory Group
4388 Glendale-Milford Road
Cincinnati, OH 45242-3706
513-733-5336 Phone
513-733-5347 Fax

ENVIRONMENTAL CHEMISTRY
QUALITY ASSURANCE PROGRAM PLAN
ASSIGNMENT PAGE

Control No.: ______________________________

Assigned To: ______________________________

Address: ______________________________

____

____

Received by: ______________________________

(Signature) *(Date)*

NOTICE TO RECIPIENT

This Program Plan is maintained under ALS' document control. If this plan is controlled, the control number for this copy of the ALS Quality Assurance Program Plan is indicated above. Notification of receipt must be made to ALS by returning a signed copy of this page.

Controlled copies of revisions and changes are issued from time to time. You are charged with the responsibility for:

1) Insertion of new revisions, and
2) Dispensation of outdated or superseded pages.

The revision control page indicates the most current revisions of the plan. If you find that your controlled copy is not current, contact the ALS Quality Assurance Manager for updates.

TABLE OF CONTENTS

1.0 QUALITY ASSURANCE PROGRAM PLAN IDENTIFICATION FORM AND POLICY

Document Title:	ALS Laboratory Group Environmental Chemistry Quality Assurance Program Plan
Document Control Number:	ALS/ENV QAPP
Organization Title:	ALS Laboratory Group, Environmental Division (Cincinnati)
Address:	ALS Laboratory Group 4388 Glendale-Milford Road Cincinnati, OH 45242-3706
Laboratory Director:	Jeffrey A. Ogle, B.S. Phone Number: 513-483-3171
QA Manager:	Tracey A. Earle, M.S., M.B.A. Phone Number: 513-483-3173

Plan Coverage: This document describes the ALS Quality Assurance Program for all Environmental Chemistry analytical activities at the Cincinnati facility of ALS. This program also discusses general laboratory practices and procedures used at ALS. The Plan addresses data generated and processed by ALS from the analysis of environmental samples. The Plan applies to data derived from the analysis of air, drinking water, groundwater, surface water, wastewater, soil, sludge, sediment, solid and hazardous wastes, toxic substances, and other matrices.

1.1 Quality Assurance Policy

It is the policy of the ALS Laboratory Group, Environmental Division, that all aspects of the analytical data generated and processed in the laboratory, subject to EPA, DOE or other client/project specific requirements, be of known and acceptable quality. The purpose of this Program Plan is to establish and assure that an effective quality management system is maintained in order to meet the quality requirements of the intended use(s) of the data.

The ALS QA Policy also confirms the commitment of laboratory management and personnel to comply with the requirements of all accreditation and certification programs for environmental testing in which the laboratory participates including the Ohio Voluntary Action Program (OH VAP) and the current NELAC standard.

For lead analysis, the ALS QA Policy also confirms the laboratory management and personnel commitment to comply with ISO/IEC 17025:2005 and the requirements of the American Industrial Hygiene Association's Environmental Lead Laboratory Accreditation Program (ELLAP). The laboratory is also accredited through the Ohio Department of Health's Lead Poisoning Prevention Program for Environmental Lead for Air, Dust, Paint, and Soil. This policy also confirms that laboratory management strives to continually improve the management system within the laboratory and to improve the services that are provided to the customer.

All laboratory personnel are familiar with the quality policies and procedures found in this document and/or in laboratory standard operating procedures. All laboratory personnel are responsible for the implementation of quality practices in all aspects of their work associated with preparing, processing, and reporting analytical information. Top management shall provide evidence of commitment to the development and implementation of the management system and to continually improve its effectiveness. It is also the responsibility of top management to ensure that the integrity of the management system is maintained when changes to the system are planned and implemented. This Quality Assurance Policy and the Program described herein, has the commitment and support of the ALS Laboratory Group.

CONCURRENCES:

By: Tracey Earle Date: 9-16-13
Tracey A. Earle, B.S., M.B.A., M.S.
Quality Assurance Manager, ALS Environmental

Approval for Implementation:

By: __________ Date: 9/16/13
Jeffrey A. Ogle, B.S.
Laboratory Director, ALS Environmental

1.2 ALS Laboratory Groups' Corporate Policy on Waste, Fraud, and Abuse

ALS' policy on waste, fraud, and abuse is outlined in the ALS Standard Operating Procedure (SOP), "Laboratory Ethics." It is the policy of ALS to generate accurate and reliable data in accordance to all contractual and regulatory requirements. It is against ALS policy to improperly manipulate or falsify data, or to engage in any conduct that would diminish confidence in the laboratory's impartiality and/or judgment as defined in the Laboratory Ethics SOP. The ALS Quality Assurance Manager and/or the pertinent Section Manager must approve deviations from contractual requirements (protocols) and/or SOPs. The Manager obtains approval for any such deviations, either in writing or by telephone, from appropriate contract authorities and documents the authorization in the applicable data package. In addition, ALS requires that deviations from contractual requirements that might affect data quality be reported to customers. Any employee who knowingly manipulates and/or falsifies data or documents, or engages in any other unethical conduct, is subject to immediate release from employment at ALS.

It is also the policy of ALS to perform work for customers in the most efficient manner possible, avoiding waste of resources. It is the role of both ALS Management and employees to ensure that work for customers is performed most efficiently and effectively by properly utilizing ALS purchased materials, equipment, and the time and ability of personnel.

ALS is also concerned for the employee and takes appropriate steps to protect employees from work hazards, unsafe practices, and undue stress of both internal and external parties.

ALS employees, who are aware of, or reasonably suspicious of any case of data manipulation, falsification of data, waste of resources, undue pressure or influence or other unethical practice or misconduct must notify the appropriate manager or grievance committee. Under the direction of the Laboratory Director, grievance committee and/or the section manager, every allegation of unethical conduct must be fully investigated and appropriate actions are taken.

2.0 INTRODUCTION

2.1 Purpose

This plan is intended to provide general direction for the handling and processing of environmental samples, performance of analyses, and the generation of data; it is not intended to provide in-depth technical discussions. Standard Operating Procedures (SOPs) and the analytical methods are designed to provide in-depth technical discussions in support of analytical activities necessary to provide data of consistently high quality (see Section 14.3- Document Control and Appendix 6- Listing of Lab SOPs). ALS' Policy Manual is provided to the Laboratory Director by the company's Houston Texas Corporate Office. ALS' QAPP, SOP's, and Policies outline the company's Quality System.

2.2 Applicability and Scope

The quality assurance program plan presented in this document applies to environmental analytical data generated and processed by ALS and serves to assure that the data meet the users' requirements in terms of accuracy, precision, completeness, and comparability.

This program is designed to meet analytical and documentation requirements, including litigation requirements, chain-of-custody procedures, QA of data reduction, data generation, reporting activities, document control procedures and nonconformance/corrective action activities. The program outlines the purpose, organization, objectives, and operations established to support analyses conducted at ALS. Since ALS is primarily responsible for only the analysis of environmental samples and not the sample collection, this quality assurance program plan does not address field sample representation or other field sample collection activities. Project specific QA plans are written to meet the contractual and regulatory demands of individual projects and/or customers, as necessary.

The aim of this quality assurance program is to ensure consistent, accurate analyses of samples according to applicable current analytical techniques as delineated in various methods from governmental agencies including both the federal and state EPAs. This program is intended to provide general direction for environmental analyses and is not intended to provide in-depth technical discussions. Laboratory Standard Operating Procedures (SOPs) and analytical methods provide specific technical directions and discussions in support of analytical activities necessary to provide consistent quality data.

2.3 *Revision, Distribution, and Control*

All quality assurance program documents, including Quality Assurance Program Plans, Standard Operating Procedures, and reference methods, are controlled for the purpose of traceability, distribution, and revision. All controlled documents must have distribution approval by designated personnel. The approvals required for distribution and revision of the controlled documents are as follows:

Distribution of controlled documents:

- ALS Quality Assurance Manager

Revision of controlled documents:

Standard Operating Procedures:

- ALS Laboratory Director
- ALS Quality Assurance Manager
- ALS Section (Technical) Manager, if necessary

ALS Quality Assurance Program Plan

- ALS Laboratory Director
- ALS Quality Assurance Manager

Reference Methods

- ALS Quality Assurance Manager
- ALS Section (Technical) Manager

Control of quality documents:

- ALS Quality Assurance Manager

Concurring signatures and dates of implementation indicate approval of program manuals and SOPs.

2.4 Quality Assurance Program Plan Review

At least annually, the Quality Assurance Manager reviews the Quality Assurance Program Plan and, if no revisions are necessary, documents the review in the Controlled Documents Database. This action will not cause the revision of controlled copies held by parties other than the laboratory itself.

If any revisions are required, the necessary changes are made by the QA Manager, and are reviewed by the Laboratory Director, and copies of at least the revised pages are forwarded to the holders of controlled copies of this document.

2.5 Revision of Ohio Voluntary Action Program Approved Quality Documents

Proposed revisions of quality documents, including this Quality Assurance Program Plan and preparative and determinative standard operating procedures that are contained on scope of accreditation of the Ohio Voluntary Action Program (VAP) must be reviewed by Ohio VAP personnel prior to implementation. This review consists of submitting a request for technical assistance and a technical review followed by written authorization from VAP personnel that changes can be implemented.

3.0 LABORATORY ORGANIZATION AND PERSONNEL

3.1 *Introduction*

Ultimate responsibility for the conduct of all projects and approval for the implementation of all programs at ALS resides with the Laboratory Director. Functional responsibility for the technical operations is delegated to the appropriate Section Managers. The Quality Assurance Manager (QAM) maintains responsibility for the development, maintenance, and revision of quality assurance and quality control operations in the laboratory.

The Quality Assurance Section of ALS is independent of all programs involved in the various data generation processes of laboratory operations. The QA section reports directly to the Laboratory Director.

In the absence of the Quality Assurance Manager, Laboratory Supervisor or the Section Manager, the Laboratory Director, or his designee, assumes the required duties of the vacant position. Prior to extended absence of the Laboratory Director, an individual must be assigned as “Acting Director.”

Appendix 1 is an example of the ALS organization chart. This chart illustrates the relationship between the Office of the Director, the Section Management, and Quality Assurance.

The ALS Laboratory Group, Environmental Division is headquartered in Houston, Texas and is a Campbell Brothers Limited Company from Brisbane, Australia. , ALS Laboratory Group, Environmental Division (Cincinnati) operates as a self- sufficient entity for all quality related activities. The Houston, Texas facility provides support with payroll, employee benefits, and accounts payable issues, but has no direct control and/or impact on the quality of data generated by the Cincinnati facility.

3.2 *Responsibilities for Quality Assurance*

ALS is committed to complying with ISO/IEC 17025:2005, AIHA, and the Ohio Voluntary Action Program policies and procedures to generate data of known and documented quality. (See section 1.1 of this policy). Ultimate responsibility and authority for the conduct of all projects and approval for the implementation of all programs at ALS resides with the Laboratory Director. Functional responsibility and authorities for the analytical work is delegated to various Section Managers, Analysts, and the Quality Assurance Manager as described below.

3.2.1 Laboratory Director

The Laboratory Director's responsibilities and authorities are:

- To ensure that ALS resources are adequately allocated to specific projects and that sufficient staffing, equipment, and support are provided.
- To oversee the technical operations' Section Managers and the Quality Assurance Manager
- To ensure that sample handling, instrument calibration, sample analysis, and related activities are conducted and documented as described in this QAPP, its related Standard Operating Procedures (SOPs), and its referenced methods.
- To ascertain that routine QC samples are prepared, analyzed, and reviewed as required by this QAPP.
- To make certain that corrective action is initiated and completed to remedy discrepancies or problems identified in any laboratory process.

The Laboratory Director reports directly to the President and Chief Executive Officer of ALS.

3.2.2 Section Manager

The Section Managers' responsibilities and authorities are:

- To understand and follow this QAPP with its references.
- To supervise employees within their specific analytical area and to ensure their work is compliant with the ISO/IEC 17025:2005 as well as Ohio VAP requirements.
- To communicate with Customer Contract Officers and Managers.
- To coordinate sample flow and to implement quality assurance and quality control activities in their area of authority.
- To work, in conjunction with the Quality Assurance Manager, to ensure that QA/QC procedures as well as corrective action procedures are implemented and effective.
- To ensure that facilities and equipment are maintained and utilized effectively.
- To report unresolved technical and quality problems to the Laboratory Director.

3.2.3 Quality Assurance Manager

The Quality Assurance Manager's (QAM) responsibilities and authorities are:

- To monitor the QA and QC activities of the laboratory to ensure conformance with ISO/IEC 17025:2005 including authorized policies (QAPP) and procedures, good laboratory practices, and to recommend improvements as appropriate to the Laboratory Director.
- To ensure that the management system is implemented and followed at all times. This manager has direct access to the highest level of management at which decisions are made on laboratory policy or resources.

- To inform specific Section Managers of noncompliance with the approved QA/QC criteria.
- To ensure that all records, logs, standard operating procedures, project plans, and analytical results are maintained in a retrievable fashion.
- To conduct and document internal audits of laboratory procedures to ensure compliance with this QAPP and its references.
- To arrange for the analysis of QC and performance evaluation samples
- To maintain a record of ongoing personnel training for QAPP-related activities.

3.2.4 Laboratory Analysts

Laboratory Analysts include the Laboratory Director, the Laboratory Supervisor, Section Managers, Group Leaders, Chemists, Scientists, Technicians, or Lab Assistants. Please see the Lab's Position Descriptions file located in the QA Office for further position descriptions of the different analyst positions.

The Laboratory Analysts' responsibilities and authorities are:

- To prepare, analyze, report, and review the analytical information according to ALS's quality objectives, ISO/IEC 17025:2005, and Ohio VAP requirements.
- To read and understand standard operating procedures in conformance with the Quality Assurance Program
- To perform an initial review of data that is generated during the analytical process and to identify nonconforming events within the scope of concern.
- To implement corrective actions in conjunction with laboratory management and QA.
- To review peer analyst's data packages when they are experienced with analytical processes. This review process is explained in more detail in Section 9.5- Data Review within this document and the laboratory SOP on Data Reduction and Validation (GEN-005).

3.2.5 Sample Receiving

Sample Receipt is managed by the IT Support Manager and coordinated by the Sample Receipt Coordinator. Sample Receipt Personnel responsibilities and authorities are:

- To perform the initial assessment of samples, including documentation of sample conditions upon receipt,
- To disseminate the customer's requests on the LIMS Work Order according to ISO/IEC 17025:2005 and Ohio VAP requirements.
- To resolve and document any issues associated with the initial assessment. Resolution may include discussions with laboratory personnel, customer contacts, and/or laboratory management.

- To accurately input customer sample information into the data management system and to assign laboratory set identification and individual sample identifiers (following the initial assessment).
- To initiate laboratory tracking process.

All information generated during the sample receiving process is included in the data set from initial assessment through analysis and review to archive.

3.2.6 Computer/IT Support

The LIMS is maintained by the IT Support Manager according to SOP –QA-004- "Archives". Validation of computer data management processes is completed with each data package review and ensures compliance to ISO/IEC 17025:2005. Analytical instrumentation software is the responsibility of each analyst and/or Section Manager utilizing the analytical system. The instrumentation used within the laboratory relies on computer software programs that were supplied with each instrument. The manufacturer has validated these packages and proper performance is verified with the data package review. Electronically generated data from analytical instrumentation are maintained according to SOP- QA-004- "Archives" and GEN-021- "Network Systems and Security".

3.2.7 Receptionist

The Receptionist's responsibilities and authorities are:

- Providing administrative support to Cincinnati Lab
- Works with Sample Receipt Department logging in samples
- Answering phones
- Duties in accounts payable and receivable
- Duties in general office reception
- Organizing and filing competed lab work

3.2.8 Environmental Health and Safety Manager/Radiation Safety Officer

The Environmental Health and Safety Manager's responsibilities and authorities are:

- To monitor the workplace and maintain safety-related equipment
- To train employees on health and safety
- To lead the Laboratory Safety Committee
- To maintain supervision and control over all activities involving radioactive materials.
- To provide consultation on aspects of radiation protection to personnel at all levels of responsibility
- To maintain personnel/area monitoring records

- To supervise and coordinate the disposal of all radioactive waste

3.2.9 Project Manager

The Project Manager's Responsibilities and authorities are:

- Responsible for technical project management, ensuring overall data quality and compliance with customer requirements.
- Providing technical support to clients regarding laboratory application to projects.
- Responsible for direct technical project management
- Providing technical interpretation assistance, as well as project organization of work received and reported by the laboratory.

3.3 Communication

Effective communication within the laboratory is necessary for a responsive, efficient QA program. Routine, well-established communication channels between laboratory management and activity groups in the laboratory ensure that quality issues are efficiently and effectively resolved. Communication consists of both frequent and open informal daily communication and structured formal communications. Communication records may be required for routine or non-routine issues.

Environmental samples received at ALS are evaluated on a daily basis to assess QA and QC requirements. Both management and analytical personnel are consulted by sample receiving to ascertain special QA needs or for the resolution of problematic items. Customer representatives are often contacted to clarify or resolve issues that may arise. Environmental samples and the associated paperwork (chain-of-custody, analysis requests, etc.) are reviewed by sample receiving personnel and laboratory technical personnel before analytical procedures are initiated to ensure adherence to the requirements of applicable QA project plans, laboratory procedures, or analytical methodology.

Formal records accompany the field sample project file during its course through the analytical process. These records consist of the initial forms generated during login at ALS, the sample data, and, finally, the analytical report. Formal records of communication may be present on any of the records as required, and may take the form of notations of telephone conversations, descriptions of method deviations, identification of nonconforming items, corrective actions taken to resolve nonconformities, if possible, or additional analytical and reporting instructions.

3.3.1 Quality Assurance Reports to Management

Quality Assurance audit findings, from both internal and external sources, proficiency test results, control limit updates and general laboratory QA/QC activities must be communicated to the management staff. Corrective action records must be reviewed for management resolution. To achieve this, Quality Assurance makes regular reports to laboratory management.

Any member of laboratory staff has the authority to generate Nonconformance/Corrective Action Records and the record is then forwarded to the appropriate Section Management and/or to QA. Section Management and QA determine the extent of the nonconformance, the possible causes, then, if appropriate, determine the corrective actions steps to be taken to resolve the issue and prevent reoccurrence. If corrective action is required, that action is the responsibility of the personnel assigned by QA and/or Section Management. QA is responsible for a final review of the issue to ensure that the required corrective actions steps have been implemented and were effective and for control of the documentation generated during the process. If actions have not been implemented, the documentation is forwarded to the Laboratory Director for resolution. In this manner, QA/QC deficiencies are formally recorded and resolved efficiently and effectively.

As needed, QA/QC activities are planned and discussed between the QA manager and Section Management. These discussions may also include the Laboratory Director and any relevant analyst.

Proficiency test results are reported to laboratory management by QA upon receipt from the reporting agency. These reports may include nonconformance/corrective action records to address outlying results or performance.

Internal audits are performed at least annually on each laboratory section and conform to laboratory standard operating procedures and applicable certification requirements, including ISO/IEC 17025 and Ohio Voluntary Action procedures. Upon completion of these audits, QA issues a findings report to the Laboratory Director and all Section Management.

The Quality Assurance Section and the appropriate Section Managers, or designees participate in second and third party assessments performed by customers, customer representatives, or certifying agencies. The Laboratory Director may also participate in the assessment as deemed necessary. Quality Assurance forwards feedback acquired through the audit closing session to the relevant Section Manager.

Training and general staff meetings are also organized to disseminate information to larger groups of personnel. The Laboratory Director, Section Manager, or any person with sufficient relevant reason may call the meetings.

3.4 Management Review

Management Review meetings, attended by all laboratory management and QC, are conducted at regular intervals, to review the laboratory quality assurance system and to verify that the system is suitable and effective in meeting the needs of the customers, regulatory agencies, and certification programs. Quality topics addressed include proficiency testing, Nonconformities/Corrective Action Reports, internal audit findings and corrective actions, etc. The meetings may be used to determine solutions to quality and/or laboratory issues. Management Review meetings may address topics of special concern, suggested by the QA Manager, Section Management or Laboratory Director. Routine meeting topics include strategic planning, equipment needs, staff duties and needs, and reviews of upcoming projects to determine facility and resource requirements and suitability. The SOP- QA-010- “Management Review” gives further information regarding Management Reviews and the information distribution process following meetings.

3.5 Compliance with Certification Programs

It is the responsibility of all laboratory management personnel, including the Laboratory Director, Section Management, and QA to ensure that laboratory procedures comply with the requirements of all certification programs, including requirements specified in ISO/IEC 17025:2005 and the Ohio Voluntary Action Program Rules. Laboratory management is also responsible for ensuring that laboratory personnel understand their duties in response to certifications and those analytical activities in support of accreditations meet the needs of both the customer and the appropriate certification program.

4.0 PERSONNEL QUALIFICATIONS AND TRAINING

4.1 Introduction

All ALS personnel assigned to perform tasks related to environmental sample data quality are required to have education, training, and experience commensurate with their assigned responsibilities and duties. The specific training and experience of each individual employed at ALS is documented in training files maintained by the QA department. Initiation and maintenance of the training is conducted in accordance with the ALS standard operation procedure, QA-006- “Employee Training and Documentation.” ALS personnel are required to receive training before being given the responsibility of analyzing field samples. Laboratory personnel are responsible for the maintenance of their individual training files as training is received. Quality Assurance reviews the training files during internal audits to assure completeness and accuracy.

4.2 Quality Assurance Training

The QA Manager is responsible for conducting the orientation and on-going training of personnel to the ALS Quality Assurance Program Plan. Training in Quality Assurance includes training in general laboratory procedures through required reading of general laboratory SOPs and/or this Quality Assurance Program Plan. Training also includes training in ethical conduct of laboratory personnel, including required reading of the SOP regarding laboratory ethics (GEN-015- “Laboratory Ethics”).

The QA Manager initiates training files for new employees. This file contains current copies of curriculum vitae, job description, college diploma, record of employee training, record of SOP readings; experience attained outside of ALS, training meeting attendance, and proficiency test results. All personnel training documentation is maintained in the analyst’s training file.

The QA Manager, in conjunction with the pertinent Section Managers, assesses the personnel training needs as developments occur, and conducts such training to assure compliance with contractual requirements, certification requirements and state and federal regulations. In the case of general information, training may take the form of one-on-one or group meetings and/or laboratory memorandums.

4.3 Technical Training and Proficiency

All ALS personnel receive the necessary technical training to ensure that procedures are followed and data of known and expected quality is obtained. Each laboratory section establishes the criteria required of analysts concerning instrumentation and QC principles. The pertinent Section Manager, or his designee, initiates technical training records for all new and current ALS employees. It is the Section Manager’s responsibility to implement, approve, and verify adequate employee technical training.

Experience gained prior to employment at ALS is verified through performance evaluated by the Section Manager. The Section Manager uses quality control samples to validate the analyst's performance. Documentation of this performance is also included in the training file on an Analyst Qualification Form. General maintenance of instruments is included in the analyst training.

Technical training for analytical procedures is accomplished through the use of reading materials (SOPs, approved methods), observation of an accomplished analyst, and hands-on performance under direct supervision of Section Management or a fully trained analyst.

Training is an ongoing process and continuous improvement of employees is stressed by ALS. Methods employed to further the analyst's knowledge and abilities include on-site training with experienced and accomplished personnel at the ALS Cincinnati laboratory, attendance at training seminars, conferences and conventions, and membership in professional organizations. Documentation of outside training in the form of certificates, diplomas, etc. is maintained in the employee's training file.

4.4 Safety Training

The Laboratory Health, Safety, and Environment Manager is responsible for conducting safety training for all employees and provides additional training as required or deemed appropriate. Initial safety training is provided when new employees are hired. Refresher courses may be held, as needed, to ensure continuous compliance to and understanding of safety practices. New material may also be introduced during safety meetings and through laboratory memorandums.

4.5 Additional Training

For analysts performing analyses of samples from suspected radioactive facilities, the Radiation Safety Officer conducts training in the handling of radiological materials. When training has occurred documentation pertaining to radiation safety training is archived in the employee's training file.

The technical supervisors conduct training in the use of computer systems and/or computer software on an as-needed basis.

Other training not directly involved with the analytical process, but still integral to the management system, is performed using SOPs, laboratory documents, and hands-on activities under the supervision of experienced personnel.

5.0 SAMPLE RECEIPT AND CHAIN OF CUSTODY

5.1 Applicability and Scope

To assure the legal defensibility of laboratory analyses, it is required that all sample-handling events follow strict receiving, logging, and chain of custody procedures. This requirement applies to all sample materials submitted to ALS for analysis and follows the sample materials through every stage of processing. Detailed records of receipts, transfers, and disposals must be meticulously kept in order to meet the needs of current sample tracking requirements. Where applicable, documentation of laboratory radiation surveys, initiated upon receipt of the samples by the laboratory, is contained in the sample file generated by the sample receipt section.

5.2 Sample Receiving and Logging

ALS utilizes well-established and controlled procedures for sample handling which include receiving, logging and tracking. These procedures require that all aspects of receiving be documented. This documentation includes recording the condition of the sample materials upon receipt, maintaining the customer’s chain of custody, and initiating laboratory sample tracking.

The ALS Sample Receiving personnel examine all samples upon receipt by the laboratory to ensure that all required conditions are met, as described in the laboratory standard operating procedure. The required review includes: the condition of the samples, the cooler temperature (if applicable), relevant preservatives (pH), and the accuracy and completeness of the field chain of custody.

Any discrepancies found during receipt are resolved by consultation with appropriate personnel prior to the logging of the samples. This may involve Laboratory Director, Section Managers, QA Manager, or customer contacts. Applicable telephone conversation records are recorded on a phone log for inclusion and archive in the project file.

After sample receiving has been completed, the Sample Receiving personnel initiate standard laboratory logging procedures. This includes assignment of a specific laboratory number for each sample, assignment of a work order number, and generation of a digital work order summary. The following information is entered for each set of samples: a work order number, project name, ALS laboratory numbers (unique laboratory identification number for each sample), collection date, date received, date due, sample matrix, analyses requested (test code), and storage location. An example of an ALS field Chain-of-Custody and a typical work order summary is presented in Appendix 2.

When receiving potentially radioactive samples from the established list of DOE customers or from suspected DOE sites, the Radiation Safety Officer, or his designee, performs a survey on the sample containers and samples with a radiation survey meter to verify radiation is within the range of acceptability of the ALS license agreement with the Ohio Department of Health. All survey meters used for sample contamination surveys are subject to a written, documented calibration procedure. Survey instruments are calibrated as required or whenever repairs are necessary. The Radiation Safety Officer maintains copies of the calibration records in the radiation safety file. It is the responsibility of the Radiation Safety Officer to maintain current calibrations of the survey equipment.

Following sample receipt, project information is posted on the laboratory tracking board and project set or subset folders undergo a secondary review before being forwarded to the appropriate sample processing sections.

5.3 Sample Security and Storage

Following receipt, environmental samples are stored according to analytical method requirements for storage and preservation. Samples for organic analysis are stored in refrigerators in the sample storage area. When possible, samples for the analysis of volatile analytes are stored in a separate, designated refrigerator away from all other samples in the sample storage area. This is not possible when a single soil jar is submitted for multiple analyses and, in that case, the samples are stored in the semi-volatile/inorganic refrigerator and documentation is noted on the sample receipt documents. Soil and water samples for inorganic analysis are stored in the refrigerators. Bulk materials for inorganic analysis are stored in the sample storage area at room temperature. Samples are maintained in the sample storage area until properly transferred to an analyst for initiation of the analytical process.

Sample security is maintained at all times in the laboratory. All outside doors of the laboratory are locked twenty-four hours a day except for the main business entrance and the sample receiving entrance, which are open and monitored during the normal operating hours. When not monitored, the sample receiving entrance is locked. Individuals who are not employed by ALS are not permitted in the laboratory except when accompanied at all times by a laboratory staff member who is familiar with the laboratory policy on security and confidentiality.

5.4 Sample Tracking

Sample tracking begins in the laboratory with completion of the customer initiated field chain of custody. This document must be present upon receipt of the samples at ALS. If no field documentation is present, the laboratory offers blank chain-of-custody records for customer use.

After sample receiving and logging procedures have been completed, samples are tracked within the laboratory by use of LIMS sample tracking feature that lists sample status in the laboratory from storage through preparation to analysis and reporting.

5.5 Sample Disposal

Upon completion of sample processing, the sample materials may be either returned to the customer, if requested, or disposed of according to the laboratory standard operating procedure. All radioactive samples are returned to the customer following analysis. Returned materials must follow strict laboratory chain of custody documentation to ensure proper record of transfer. Samples disposed of by the laboratory are first archived for the standard holding period (sixty days) or as specified by contract. The samples are then reviewed for possible rating as a hazardous material. All laboratory waste is accumulated, stored, and disposed in accordance with all federal and state laws and regulations through a licensed waste disposal contractor (currently Clean Harbors). Please see SOP- SC-003- “Processed Sample Storage and Disposal” for more information.

Unused portions of radioactively contaminated samples are disposed of as required by the Ohio Department of Health upon completion of laboratory analysis and archiving (please see SOP- RAD-001- “Handling and Disposal of Radioactive Materials”). The Radiation Safety Officer maintains authority for ensuring these materials are properly packaged and transferred per current regulations.

5.6 Chain of Custody

In order to assure that legally defensible data are produced at ALS, chain of custody procedures are established and are followed by all personnel involved in the sample handling process. The sample tracking feature of LIMS provides the documentation necessary to record sample and/or preparation transfers from one person to another. Laboratory personnel are trained in the proper laboratory procedure for custody transfers utilizing LIMS sample tracking for both receiving and relinquishing samples as required in the laboratory SOP-QA-007- “Chain of Custody and Laboratory Tracking”.

Sample tracking is initiated at sample receipt, when the sample information is logged into LIMS. The samples are tracked through storage, preparation, analysis, and final disposition.

6.0 FACILITIES, EQUIPMENT, AND SERVICES

6.1 Introduction

To provide the services necessary to ensure acceptable analytical data, ALS must maintain a high level of quality regarding facilities and equipment. Measures are taken to ensure good housekeeping in the laboratory. Special procedures are in-place where necessary (for example-SOPs- ENV-001- Inorganic Glassware Cleaning and ENV-002- Organic Glassware Cleaning). To this end, ALS ensures that the following are maintained in the laboratory:

- Adequate and acceptable facilities (*e.g.*, lighting, ventilation, temperature, humidity, *etc*.)

- Adequate and acceptable utility services (*e.g.*, voltage control, air, water, gas, *etc*.)

- Adequate and acceptable general laboratory facilities and equipment (*e.g.*, refrigerators, laboratory fume hoods, sinks, bench areas, *etc*.). There is adequate separation between neighboring labs in which there are incompatible activities to prevent cross-contamination.

6.2 Preventive Maintenance/Performance Monitoring of Equipment

Preventive maintenance is performed on laboratory equipment to assure quality performance of the instrumentation. Routine preventive maintenance is performed on the gas chromatographs (GCs), GC/MS systems, liquid chromatographs (LCs), the mercury analyzer, inductively coupled plasma-atomic emission spectrometers (ICP-AESs), analytical balances, and other analytical instrumentation. Preventative maintenance is performed either under manufacturer's warranty, according to schedules prearranged by contract with the appropriate vendors, or by ALS staff in accordance to laboratory standard operating procedure. Appendix 3 lists the instrument preventive maintenance schedule and Appendix 4 provides a list of current laboratory instrumentation. There are service contracts on some of the laboratory instrumentation.

In addition to the preventive maintenance checks, the analysts complete routine equipment performance checks prior to the analysis of environmental samples through the use of standards, calibration check or verification samples, and quality control samples. Each analyst is responsible for the maintenance of equipment immediately prior to analytical testing. Activities related to instrument maintenance are documented in the instrument's maintenance logbook. Instrument maintenance logbooks are assigned to and stored near the applicable instrument.

Refrigeration and freezer units are monitored for performance on a daily basis using verified thermometers (4°C ± 2°C for refrigerators, -10°C to -20°C for freezers). The daily monitoring records are compiled and archived monthly by Quality Assurance. The thermometers used in daily monitoring are compared at least annually to a NIST certified thermometer, obtained from an A2LA or NVLAP

accredited provider to ensure accuracy. Thermometers with temperatures that vary beyond 0.5°C when assessed are replaced. Correction factors are not used for thermometers.
The infrared thermometer used in the sample receiving area and the dial type thermometer used in the NEVAP in the extraction laboratory are verified quarterly using the same procedure as that of the daily monitoring thermometers. The analyst performs analytical balance verification prior to the first use of the day of each balance. This verification is accomplished using check weights that bracket the working range, or expected range of use, of each balance. Documentation of this verification is maintained in the balance's calibration logbook located near the appropriate balance. Additionally, Quality Assurance performs verification of balance performance weekly using NIST traceable standards. This verification is documented in the QA balance notebook. At least annually, QA verifies the weights used by the analyst for daily verifications against the NIST traceable standard weights. This documentation is also maintained in the QA balance notebook. Annually or as needed, balances are serviced by a qualified professional balance service. The QA department maintains documentation of this balance service. Quality Assurance maintains responsibility for balance maintenance and performance.

Pipettes are verified, at least monthly, by Quality Assurance or a designee. Pipette verification is performed at multiple volumes, if possible, and corrected for the density of water relative to temperature. Specific procedures for pipettes verification can be found in SOP- QA-011- "Supporting Equipment Calibrations and Verifications". Documentation for the verifications is maintained in QA logbooks.

Heating sources, including water baths, drying ovens, etc., are monitored to insure that the correct temperature is maintained for the intended use. Oven thermometers are verified using the same procedure as the thermometers found in the refrigerators. The hot block digestion system is monitored weekly by QA to verify the correct digestion temperature setting. This verification is documented in QA logbooks.

Any instrument that does not perform within acceptable laboratory standards is removed from service by physical removal, if possible, until such time that its performance has been corrected. If physical removal is not possible, the article is clearly tagged pending repair or replacement so that laboratory personnel do not attempt to use instrumentation that does not perform to specifications.

6.3 Laboratory Facilities and Capabilities

ALS operates separate laboratory facilities in Cincinnati, Ohio and in Salt Lake City, Utah. Initial construction and furnishing of both sites was completed in 1988. Both sites were originally designed for the analysis of trace pollutants in environmental and industrial hygiene samples. In January of 2004, DataChem Laboratories, Inc. acquired Paragon Analytics, in Fort Collins Colorado. In October 2008 DataChem Laboratories, Inc. was acquired by ALS Laboratory Group. The acquisition increased the overall capabilities and the North American presence of ALS.

ALS (Cincinnati) is a full service analytical laboratory, providing a wide range of both environmental and industrial hygiene services. The laboratory has a current full-time staff of approximately 25 technical and administrative personnel. Qualified and knowledgeable technical and managerial personnel utilize state of the art equipment to provide analytical services that can meet customer needs and provide customer satisfaction.

ALS (Cincinnati) comprises approximately 11,000 square feet of laboratory and office space (see floor plan in Appendix 5). The facility is divided into three areas; approximately 4,000 square feet of office space and archive areas, 5,000 square feet in the main laboratory area, and 2,000 square feet in the instrumental and sample receiving area.

6.3.1 The General Laboratory

The laboratory was designed to provide the necessary utilities for the preparation of samples and to separate the sample preparation areas from the analytical areas. The air handling system supplies tempered make-up air to each room and is designed to minimize air exchange between laboratory areas. De-ionized water is supplied to all laboratories from a central ion exchange system. Ultrapure water is generated in the inorganic prep area by a Barnstead E-Pure system. Solvent storage is provided in appropriate storage cabinets and under-hood storage in the organic prep, gas chromatography and wet chemistry areas. Sample storage has temperature-monitored refrigerators and freezers for storage of samples and sample extracts.

The instrumentation laboratory contains GC/MS, HPLC, IC, ICP-AES, and Cold Vapor Mercury Analyzer systems. This area also contains computer equipment used for data management and report generation. The analytical laboratory is divided into four separate technical sections and sample receiving. A designated Section Manager supervises each analytical section. The analytical sections include: Microscopy, Inorganic Spectroscopy and Wet Chemistry, Chromatography, and Mass Spectroscopy.

A separate Quality Assurance Department, under the supervision of the Laboratory Director, monitors overall laboratory performance relating to analytical quality and compliance.

Brief descriptions of each laboratory analytical section follow.

6.3.2 Sample Receiving and Storage

The sample receiving room has allocated sufficient bench space for the daily receiving activities of the laboratory. This area includes receiving, supply storage, facilities for shipping, and a computer workstation. Sampling media storage is maintained in three sections in the laboratory. Industrial hygiene media storage is maintained in the office area while containers for environmental sampling are maintained in the instrumentation laboratory and in a laboratory storage area. When requests for media or containers are received, the sampling supplies are transferred to sample receiving for customer pick-up or shipping. A fume hood is located in sample receiving for worker safety.

The sample storage room is a separate area in the laboratory. The room has adequate shelving and temperature-monitored refrigerators and freezers for storage of samples. Excess sample materials may also be archived here during their post-analysis holding period. Industrial Hygiene QC samples are stored in a designated freezer within this area and remain separate from all customer samples.

Laboratory personnel control access to the storage room and the entire laboratory maintaining the security of the ALS facility.

6.3.3 Microscopy

The microscopy section of the laboratory performs polarized light microscopy (PLM), phase contrast microscopy (PCM), and transmission electron microscopy (TEM) analyses using current NIOSH, EPA, and ELAP analytical methods. The PLM laboratory is equipped with both standard and desktop laboratory fume hoods, stereomicroscopes, and polarized light microscopes with photographic capabilities. Bulk building materials, soils and dust samples are analyzed for asbestos by PLM. If necessary, the asbestos percentage in low concentration or problematic samples can be confirmed using point counts, gravimetric reduction or TEM analysis. The PLM laboratory also has the ability to perform general dust characterizations and ceramic fiber analysis.

Air filter samples are analyzed for fiber concentration using phase contrast microscopy. The PCM laboratory contains a desktop hood for sample preparation and 2 phase contrast microscopes.

In the transmission electron microscopy laboratory, bulk, air and water samples are analyzed using a Philips CM-12 TEM with electron micrograph, energy dispersive X-ray analysis (EDXA) and on-screen measurement capabilities. This instrument allows immediate and accurate characterization of fibers containing specific asbestos mineral species or as a non-asbestos fiber. TEM samples are prepared in a class-1 ventilated clean bench to prevent cross-contamination of samples, contamination of the facility, and to insure technicians’ safety. In addition to asbestos analysis using government published methods, ALS has developed sample preparation and analytical procedures for characterization of samples with non-standard requirements.

6.3.4 Inorganic and Wet Chemistry

The inorganic and wet chemistry section of ALS performs metals analyses by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES), mercury analyses by Cold Vapor Mercury Analyzer and performs a variety of colorimetric analyses, including NOx, formaldehyde from OVM monitors, cyanide and sulfide by visible light spectrophotometry. This section of the laboratory also performs analyses of total petroleum hydrocarbons, oil and grease, and oil mist using infrared spectrophotometry.

Other tests performed by the inorganic and wet chemistry section include: dust weight analyses, flashpoint and ignitability, pH measurements, and various titrimetric and specific ion electrode analyses. This section has the ability to generate TCLP extracts for the organic and inorganic analytes. All analyses are performed in accordance with current NIOSH, OSHA, EPA SW-846, EPA-CLP, or EPA drinking water guidelines.

The inorganic and wet chemistry section has a separate metals sample preparation laboratory equipped with a fume hood, 2 microbalances, a deionized water system that produces 18 meg-Ohm ASTM Type II water, a heat controlled water bath, a temperature controlled hotplate, and three hotblock digestion systems. The hotblock sample digestion systems are used for most metals sample preparations. The hotplate digestion system may also be used for some metals sample preparations that are not amenable to the hotblock process. A heat controlled water bath is also available for use, if necessary.

Routine inorganic and wet chemistry analyses are performed from various matrices including filters, soils, sludges, sediments, paint chips, oils, various sorbent media and waters.

6.3.5 Chromatography

The Chromatography section of the Laboratory performs analyses using Gas, High Pressure Liquid and Ion Chromatography (GC, HPLC and IC).

The gas chromatography group is equipped with chromatographs utilizing a variety of detection systems. Gas chromatography detectors in the laboratory include dual ECDs, FID/PID, ECD/FID, NPD/FID, FID/TCD allowing this section of the laboratory to perform a variety of different analyses for a wide range of applications. The GC section performs analyses of industrial hygiene samples for solvent and other organic compounds from various solid sorbent tubes and filters. Analyses also performed by GC include PCB analysis from air, water, soils and wipes, pesticides from various matrices, including TCLP extracts, total petroleum hydrocarbons in the range of diesel fuel, and polynuclear aromatic hydrocarbons. This section also has the capacity to analyze soils and waters for aromatic volatile organic compounds and total petroleum hydrocarbons in the gasoline range using traditional purge and trap sample introduction.

The HPLC/IC group uses high pressure liquid chromatographic techniques to analyze samples for formaldehyde-DNPH, polynuclear aromatic hydrocarbons from water and air samples, various estrogens, drugs used in patient treatment (ribavirin), and explosives from soil and water. The HPLC/IC group uses ion chromatography to analyze anions including acid mists (mineral acids and organic acids) from air, soils and waters, and compounds such as sulfur dioxide, ammonia, or ethanolamines from air samples.

All of the instruments used in the chromatography section are connected to data acquisition systems for data reduction and storage.

6.3.6 Mass Spectroscopy

The Mass Spectroscopy section analyzes soils, waters and TCLP extracts for volatile and semi-volatile organic compounds. Analysis is performed using EPA methods including SW-846 8260 and 8270.

The section also has the capability to perform analysis of air samples by the Clean Air Act methods including TO-13A, TO-14A and TO-15. Sampling canisters for TO-14A or TO-15 analysis are cleaned and certified by the laboratory and are available for customer sampling requirements. The Mass Spectroscopy section conducts the analysis of high volume air sampling cartridges by method TO-13A for the presence of polynuclear aromatic hydrocarbons.

7.0 PROCUREMENT AND PROCESS CONTROL

7.1 Introduction

All materials purchased by ALS for the processing of customer samples are of commercial grade or better, and must meet the requirements for which they are intended.

7.2 Procurement and Quality Monitoring of Material

Managers, or the Laboratory Director, approve all purchase order requisitions to ensure that supplies requested will adequately meet the quality and functional needs of the laboratory in the processing of sample materials. Personnel receiving shipments from providers perform an inspection of items that have been requisitioned and received to determine that:

- Damage was not incurred in shipping.
- All requested items are present or backordered items are noted.
- Transfer documentation is complete and accurate.
- The quality of supplies meets or exceeds the quality of the requested item.

The items received are rejected and returned to the supplier if any of the criteria stated above are not met.

Section Managers are responsible for determining that the quality of the reagent or bulk chemicals requisitioned and received is acceptable. This is verified during routine blank analyses.

If the analytical method or SOP does not specify the purity of materials, ACS reagent grade are used.

More specific information regarding requisition of materials that affect analytical quality of sample processing activities can be found in the laboratory standard operating procedure on procurement.

7.3 Control Requirements for Containers

Description of containers used for a specific analytical processes are identified in the applicable SOP or analytical method. For specific sample container requirements, see the table in Appendix 8.

The glassware in general use is Borosilicate unless mandated otherwise. The use of plastic containers and apparatus made of Teflon® or polypropylene is recommended for some inorganic analytical applications. Polyethylene and polystyrene may also be suitable in some specific cases as required by method. Tedlar® Bags and/or polished stainless steel passivated canisters are recommended for volatile organic compound analysis for soil gas and air samples.

The general guidelines listed below are followed when selecting the composition of laboratory vessels:

- Borosilicate or Polypropylene containers used for storage of reagents, solvent mixtures and standard solutions.
- Polyethylene or Teflon® containers used for shipping aqueous samples for inorganic analysis.
- Borosilicate glass containers used for shipping all aqueous samples for organic analysis.
- Borosilicate glass containers used for shipping all soil samples for all analysis.
- Tedlar® Bags and/or polished stainless steel passivated canisters used for soil gas and air samples for volatile organic compound analysis.

7.4 Reagents and Solutions: Labeling and Control

All reagents and solutions at ALS are properly labeled to ensure storage adequately protects the quality of the material and prevents the use of deteriorated or outdated solutions and solutions of unknown or suspect origin. Containers must have a label or marking that contains the following information:

- Identification of contents.
- Identification of responsible person.
- Concentration or percent purity.
- Unique storage requirements (if applicable).
- Preparation or expiration date, date of receipt or date of dilution from concentrate.
- Unique solution identifier from laboratory notebook or manufacturer lot number.

If it is not possible to record the information listed above on the label, the information is recorded in a bound notebook and the container will have the necessary information to direct anyone to the book and page in which the necessary information is located.

In order to assure the traceability of the quality of reagent/reference material purchased by ALS, materials must be purchased through established vendors and accompanying documentation of purity must be present. This documentation is first reviewed by the laboratory personnel upon receipt and then forwarded to Quality Assurance for archiving. The information provided on the Certificate of Analysis sheets is entered into a chemical inventory database. MSDS sheets that accompany deliveries are forwarded to the Laboratory Safety Officer for archiving. Laboratory personnel handle and transport reference standards and materials in a way that protects their integrity.

Deionized/Demineralized water is used for dilutions and preparations of standardized solutions and reagents solutions. The specific conductance is monitored on a weekly basis by QA and is documented in a QA logbook.

7.5 Computer Program Verification

Computer software used to perform data-collection, processing or reporting is validated, verified, and documented as appropriate according to the software's intended use. The software must demonstrate that it correctly performs to stated or required capabilities and that statistical models embodied in the software are valid and produce an acceptable representation of the process or system for which it is intended. This is accomplished through secondary review of the final analytical data and materials that are generated utilizing the electronic systems. Upon completion of the final report, LIMS inserts a unique electronically generated signature on the report which is authenticated by the user's password. LIMS also generates a message indicating who electronically approved the report.

7.6 Glassware Cleaning

The purpose of cleaning glassware used at ALS is to ensure that all contaminants, at trace level concentrations, have been removed and do not contribute to error propagation. ALS has established procedures to prevent contamination at trace levels that would produce data results of suspect quality (see ENV-001- Inorganic Glassware Cleaning and ENV-002- Organic Glassware Cleaning).

7.6.1 Environmental Sample Preparation Glassware

Hotblock digestion vessels are purchased to allow for digestion and storage, but also to be disposable, negating the need for cleaning and eliminating the possibility of cross-contamination from improperly cleaned glassware. All other inorganic sample processing containers are rinsed as soon as possible after use. Markings are removed from the outside of the container with methanol. The glassware is washed with a non-phosphate detergent in hot water and rinsed with tap water. The glassware is then soaked in a 1:1 nitric acid bath and rinsed with tap water. Finally, the glassware is soaked in a 1:1 hydrochloric acid bath, rinsed with tap water and then distilled water. Glassware is then place upside down on a pegboard to dry. After air-drying, all glassware is stored in cabinets to minimize contamination due to airborne particulates. Immediately prior to use, the glassware is rinsed with deionized water.

Following use, extractable organic processing glassware is rinsed with methylene chloride. Containers are then soaked in a hot water/detergent bath to loosen surface materials. The glassware is scrubbed to remove residuals and rinsed in hot tap water, deionized water, and methanol then dried in an oven. Following drying, organic containers may be covered with aluminum foil or stored in enclosed cabinets. Glassware is rinsed with the appropriate solvent prior to use. If residues persist following the cleaning process, the glassware is destroyed. All glassware is safety inspected for cleanliness, cracks, and etching before being placed in storage and/or prior to use.

7.7 Procurement of Analytical Services

Contracted laboratories that perform analytical services for ALS are required to maintain quality programs consistent with the quality requirements of ALS. In those instances where ALS has specific QA/QC requirements as a result of a contract agreement or a project plan, these requirements are also required by work subcontracted by ALS. ALS Quality Assurance periodically reviews subcontractor's Quality Assurance Program Plans and assesses the ability of the subcontractor to meet quality requirements. This information is kept in the QA office. Before subcontracted analytical data are sent from ALS to the customer, ALS reviews final reports to assure compliance. After review, the report is then sent to appropriate personnel. Any work subcontracted for ALS is identified clearly on the final analytical report submitted to the customer.

8.0 ANALYTICAL PROCEDURES AND DETECTION LIMITS

8.1 Introduction

ALS is a full service laboratory specializing in both environmental and industrial hygiene analyses. The laboratory performs a variety of analytical methods covering various matrices. All analyses are performed according to recognized published methods or methods which have been validated by the laboratory. A list of SOPs for methods performed by the laboratory is included in Appendix 6. If it is necessary for laboratory personnel to vary a written method, ALS analysts document deviations in a laboratory notebook. The notebook page is included in the data set through the analytical procedure and is archived with the data set information. Specific questions regarding method variance for specific projects or samples are best answered in discussions with the ALS Section Manager before samples are sent to the laboratory.

The ALS Fee Schedule contains a complete list of analytical services offered by the laboratory. A fee schedule is obtainable from ALS upon request. Questions regarding services are referred to ALS management.

8.2 Method Detection Limits and Reporting Limits

Limits of detection may vary by matrix type, determinative method and, in some cases, by contract. With some analytical processes, including pH, paint filter, percent moisture, gravimetric, etc., method detection limit (MDL) studies are not required due to the nature of the analytical process. If the environmental process is amenable to a detection limit study, then MDLs are conducted annually according to the SOP- DCLC-SOP-020- “Calculation of Method Detection Limits.” This SOP is based on requirements found in the Code of the Federal Register, 40 CFR, Part 136, Appendix B.

The method detection limit is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte of interest.

The process for determining MDLs consists of the preparation and analysis or in cases where sample preparation is not required, analysis only, of a blank matrix that is spiked at a level that is at or below the current reporting level and at a concentration that is one to five times the expected MDL. The matrix used for the samples may be reagent water, blank sand, sodium sulfate, or other material that is known to be free of target analytes of interest. The appropriate number of MDL samples processed is included as required by established methods, but typically ALS utilizes 7 replicates. Following the analysis of the 7 replicates, the standard deviation (S) is determined for the study using the formula:

$$S=\sqrt{\frac{n\sum x^2-(\sum x)^2}{n(n-1)}}$$

Where n is the number of replicates and x is the concentration of the replicate(s).

The MDL for the analysis can then easily be determined using:

$$MDL=T_{(n-1,1-\alpha=0.99)}(S)$$

Where S is the standard deviation determined and T is the Student's t-value appropriate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom. The Student's t-value for 7 replicates (and 6 degrees of freedom) is equal to 3.143. Student's t-values differ depending on the number of replicates used for the determination. Other Student's t-values are found in the Table 1 of the MDL procedure.

Other factors that are included in the MDL study include accuracy, precision, a calculation of acceptability for the MDL study and the calculated reporting limit based on the study.

$$\text{Accuracy (\%)} = \frac{\overline{X}}{C}*100 \qquad \text{Precision (\%RSD)} = \frac{S}{\overline{X}}*100 \qquad \text{Acceptability Factor} = \frac{C}{MDL_C}$$

Where $\overline{X}$ is the average recovery of the analyte, S is the standard deviation of the recoveries, MDL_C is the calculated MDL value and C is the spiked analyte concentration. The acceptability factor for the MDL study is in the range of 1 to 10.

The laboratory generally uses the calculated MDL times 5 to develop the reporting limit (RL) based on the MDL study. In some cases, the actual reporting limit (RL) used by the laboratory may vary depending on the determinative method, matrix, or contractual requirements. Reporting limits utilized by ALS are never less than the statistically verified MDL as determined by the MDL procedure. Current routine reporting limits are available by request.

9.0 DATA PROCESSING

9.1 Introduction

Following generation, collection, and initial storage, most data require processing or reducing from instrument output into reportable numbers. This normally involves comparison of the sample data with standards data to determine analyte concentration in the original field sample, accounting for any possible dilution during sample analysis, and an evaluation of the field sample data and the quality control data to verify the quality of the analytical process.

9.2 Data Quality

During analysis quality control check samples are analyzed concurrently with the field samples. Acceptable results for these control samples assure that the data are being collected from an acceptable or “in control” analytical process. If quality control checks during analysis indicate that the system is not within control criteria, the analysis is halted and the system is adjusted to return it to the required condition, then recalibrated and samples are re-analyzed, if needed.

Chemical standards data is used to generate a calibration curve or to re-verify the continued acceptance and use of a previously generated curve (continuing calibration). Following sample analysis, field samples and quality control sample data are then evaluated against the standard curve. Quality control sample data are used to assess the field sample data and serve as a primary determinate of field sample data quality. If the quality control sample data are within acceptable quality control ranges, then the field sample data can be considered acceptable also. If quality control sample data does not meet acceptability criteria, corrective action may be required. This may include re-preparation and/or re-analysis of the field samples, if possible, or the reporting of data with qualifiers.

Data calculations are performed utilizing all available significant figures. However, data are generally reported with two significant figures where the final number is rounded as appropriate.

9.3 Data Reduction

Mathematical models are used to generate an appropriate calibration curve from the data acquired of the analysis of chemical standards. The fitting of a curve to the standards data is accomplished through computer programs. The curve is accepted based on a visual inspection by the analyst to assure accuracy and on either an acceptable correlation coefficient (r^2) or an acceptable percent relative standard deviation (%RSD). The subsequent comparison of field sample analytical data to the calibration curve model results in the quantitation of analyte present in the field sample. Models of curves available in most computer software packages used in the laboratory include:

Linear	$y = a + bx$
Quadratic	$y = a + bx + cx^2$
Cubic	$y = a + bx + cx^2 + dx^3$
Exponential	$y = a + b(1 - e^{cx})$

Calibration Factor
(Not using an internal standard)

$$\%RSD = \frac{SD}{\text{average CF}} \times 100$$

$$\text{average CF} = \frac{\sum_{i-1}^{n} cf}{n}$$

where the cf of each analyte/calibration level is given by: $cf_i = \frac{y}{x}$

Average Response Factor
(Using an internal standard)

$$\%RSD = \frac{SD}{\text{average RF}} \times 100$$

$$\text{average RF} = \frac{\sum_{i-1}^{n} rf}{n}$$

where the rf of each analyte/calibration level is given by: $rf_i = \frac{(y * ISTD_{ng})}{(ISTD_{area} * x)}$

The coefficients a, b, c, d, and e are derived from standards data. Y is the experimental observation, x is the concentration or amount of the analyte of interest in the sample, ISTD is the nearest internal standard peak, and n is the number of calibration points.

9.3.1 Calibration and Calibration Verification

Instrument calibration is a primary facet of the Quality Assurance and Quality Control Program. Few instruments of chemical analysis can be calibrated to an absolute standard traceable to the National Institute of Standards and Technology (NIST). Analytical balances and thermometers are calibrated and verified against NIST traceable reference standards. Other analytical instrumentation, such as chromatographs, spectrophotometers, etc., is calibrated at the time of use against chemical standards. The analytical data derived from environmental samples are compared against the data derived from the standards. By comparing the data against the standards, which have been prepared at known concentration, the concentration of the analytes of interest in the field sample are determined.

Methods of calibration verification are often specified in separate analytical methods, but may also be delineated, with calibration requirements, in project or customer quality assurance plans. The criteria for the acceptability of the analytical curve are either included in the analytical procedure or method, established by the customer whose the samples being analyzed, or, in the absence of either of these options, established by the experience of the laboratory and the results of quality control samples.

Documentation of calibration for analysis is included or the location is referenced in each specific work order. ALS personnel maintain analytical standards notebooks that allow calibration standards to be traced back to their original source.

9.4 Data Reporting

Once the analyst has determined that analytical data meet acceptability criteria, a final report of the data is prepared. Reporting requirements are normally determined by the customer or data user and is delineated in the project specific Quality Assurance Project Plan or in other contractual documents.

Most ALS data reports are computer generated. The data, following reduction, are compiled into a report format in LIMS. The report is saved by the work order number. The data are associated with the customer, work order number, and sample information established at the time of sample receipt. The final report also contains a narrative that discusses negative and positive bias, a sample receipt checklist, quality control data, and analyst comments such as data qualifiers and observations.
Raw data and instrument output, along with all supporting laboratory documentation, are compiled into data packages (labeled 9” x 12” envelopes) for archive at ALS. This system is controlled by the written laboratory standard operating procedure- “Archives”- QA-004.

9.5 Data Review

All reports undergo an initial review for completeness and accuracy by the analyst. The analyst then prepares a hard copy of the data report, which along with the associated raw data, is forwarded to an appropriate secondary reviewer (see SOP-GEN-009- “Reporting of Data”). The Laboratory Director, Laboratory Supervisor, Section Manager, or peer analyst completes a Peer Review Verification Checklist for the secondary review of the data set and report before data is released to the customer. This review is performed upon the completion of each data package at a level of 100% data review and is documented by the reviewer signature on the final report.

Each reviewer performs a routine review of the data package for data acceptability. This review must include a verification of the accuracy and completeness of the following items:

- Sample accountability
- Analytical report
- Quality control analyses
- Chain of custody information
- Instrument raw data
- Standards information
- Preparation information
- Notes or flags concerning special customer requests and telephone records
- Review of manually integrated chromatograms

Quality control sample results are compared against laboratory utilized control limits. Customer or method specific control limits may also be applied as directed by the customer or certification program.

“Out of control” QC sample analysis and surrogate results are addressed by the laboratory procedure for nonconformance/corrective actions/preventive action. Typically, raw data and calculations are first reviewed. The second step is an investigation of the standards and analytical system. If no resolution has been found at this point, the samples are re-prepared and reanalyzed to ensure that initial analyses were completed using an in-control analytical system. Nonconformities may result in data “flagging” to inform the customer of any problems associated with the analysis and/or in customer consultation prior to the release of data. Factors that may result in the “flagging” of data or the contacting of customers directly include matrix effects, interfering compounds, incorrect preservation, etc. Flags applied to analytical data are defined on the analytical report. The following flags may be applied as data qualifiers:

NA If spike sample contains an analyte at a value to great to determine the spike recovery.

ND	indicates that the compound was analyzed but not detected at or above the reporting limit.
NS	indicates that the compound was not spiked in the QC sample.
J	indicates that the quantitation of the compound was at a level below the reporting limit.
B	indicates that the reported compound was found in the blank sample that was processed with the customer samples.
*	indicates any situation that requires further information be supplied to the customer. A brief explanation accompanies this flag.

QA routinely reviews and monitors quality control data formatted on control charts. Reports and data packages may also undergo quality assurance review as either the secondary data reviewer prior to the release of the final analytical report or during an internal audit.

Method blank results are assessed during the primary and secondary data review to assure lack of laboratory contamination.

10.0 INTERNAL QUALITY CONTROL CHECKS

10.1 Introduction

Data quality objectives serve as guidelines in the generation, validation, and acceptance of analytical data. To assure that generated data in the laboratory achieves the objectives of a project and fulfills the customer's needs, quality control samples and various other quality checks and procedures are performed along with the processing of customer samples.

Before environmental samples are analyzed, the analytical system is verified as meeting the criteria necessary for the generation of acceptable data. These criteria establish a controlled, reproducible environment in which data of known and acceptable quality can be produced. The analytical environment may be controlled through the use of method blanks, initial calibration verifications (ICV) , continuous calibration verifications (CCV), instrument blanks , laboratory control samples (LCS), surrogates, matrix spikes (MS), and matrix spike duplicates (MSD). The specific types of controls utilized are delineated in the appropriate methodology.

10.2 Quality Control Samples

Quality control samples include a variety of samples that are used to measure the accuracy and precision of an analytical process. The samples may be spiked with target analytes or may be duplicates of field samples depending on the parameter under consideration. Spiked samples and/or spiking solutions may be purchased through an established vendor or be prepared by the analyst. The purchased samples or solutions must be accompanied by documentation to verify traceability to an acceptable national standard. Quality control samples are prepared and analyzed concurrently with field samples.

Project specific Quality Assurance Project Plans and governmental agency QA plans normally include a requirement for the number and character of QC samples to be included with each group of field samples. Typically, at least one method blank and one laboratory control sample (LCS), or QC sample, must accompany each group of field samples at a rate of at least one per twenty field samples (analytical batch). Certain analytical methodologies or contracts may present different requirements for QC sample analyses.

Generally, QC samples are prepared at a level that is in the middle of the calibration range of the instrument or the analytical method, but the level may vary depending on the analytical process and the requirements of the customer. Quality control samples attempt to reflect the levels of interest of the customer.

Written determinative procedures may be consulted for more information on the nature of the QC samples required for the specific analytical process.

10.2.1 Blanks

Blank samples, either method blanks (MBLK) or preparation blanks, are utilized at a rate of at least 1 blank per 20 customer samples to detect the possible presence of contaminants in an analytical procedure. The blank samples must be processed by exactly the same procedure as used for the field samples. The analyst may verify the absence of contamination in the analytical process by preparing reagent blanks that are processed for analysis using all the reagents used in the processing of customer samples. Any blanks that are submitted by the customer are treated as field samples and can include trip blanks, rinse blanks, equipment blanks, and field blanks.

Calibration blanks are a calibration standard that contains no analytes of interest. These blanks are used to verify the absence of contamination in the analytical instrumentation system and that the system is not producing excess instrument noise. Calibration blanks are not prepared with field samples.

Analytes of interest must not be present in any laboratory blank at a level greater than the reporting limit used. If the level of any analyte exceeds this criterion, the source of contamination must be identified. Any field data that is reported from preparation or analytical events containing an analyte-contaminated blank must be flagged on the final report to the customer.

10.2.2 Laboratory Control Samples

A Laboratory Control Sample (LCS) is a sample composed of a known clean matrix spiked with a compound or compounds representative of the target analyte(s). When possible, the matrix should be as similar to the matrix of the field samples as possible. The LCS is used to document laboratory performance for a given method in that it provides information regarding the “best case” scenario for the analytical process negating the factors of matrix. At least one LCS sample is prepared and analyzed along with each batch of up to 20 customer samples of a similar matrix, if required by the specific analytical methodology.

LCS recovery values must be within laboratory control limits. If the LCS recovery is beyond control limits, the process may be considered “out of control” and steps are taken to return the analytical system to a controlled status. There are possible cases when LCS limits are beyond control criteria and the analytical results may still be considered valid.

Example: High LCS recoveries are obtained, but the analytes of interest are not detected in the samples: the high recovery of the LCS is noted, but requires no further action on those samples analyzed concurrently. Steps are taken, however, to avoid a possible reoccurrence of the failure in subsequent sample analyses and any positive samples, analyzed when the system is not demonstrated to be in control, are re-analyzed.

10.2.3 Matrix Spike Samples

A matrix spike (MS) is a portion of a field sample to which analytes of interest and surrogate compounds are added to assess the effect that the sample matrix has on the analytes of interest. The sample is processed by the same procedures as used for the field samples. The matrix spike duplicate (MSD) is a second portion of the field sample spiked with identical concentrations of the target analytes. This analysis is used to determine the bias and precision of the analytical method in the given sample matrix.

The matrix spike and matrix spike duplicate (MS/MSD) are prepared at a rate of 1 per batch of not more than 20 field samples as the analytical methodology requires, providing that sufficient volume of sample is submitted by the customer.

10.2.4 Surrogates

Surrogates are organic compounds that are similar in chemical composition and behavior to target analyte(s). The organic preparation analysts spike surrogates into all field samples, blanks, and QC samples prior to all sample preparation and/or analytical processing. Surrogates are calibrated and quantitated using the same process as the target analytes within the analytical procedure. Surrogate recoveries, in the form of percentages, are calculated by spiking a known amount of surrogate into a sample prior to processing and monitoring the amount of recovered surrogate during analysis. This process provides a simulation of the efficiency of the entire analytical process for the compounds of interest. Recoveries for surrogate compounds are included on the final report issued to the customer.

10.2.5 Standards

Each standard solution prepared must be traceable to the specific material from which it was prepared. ALS purchases reference standards that are traceable to an agency standard or are certified by the vendor. Outside vendors must provide a Certificate of Analysis for each chemical compound and the certificate is maintained in a QA archive. Sufficient documentation for laboratory traceability is accomplished through the use of ALS Standards Preparation Logbooks with unique solution identification numbers. Standards are verified against second sources to assure that the concentration of a standard solution or spiking solution is correct. An independent second-source standard solution is used for QC samples and for initial calibration verifications (ICV). Documentation of all standards preparation is accomplished by recording data directly into solution logbooks maintained within the laboratory.

Volatile organic stock and working standards are retained for six months, except for gases, which are replaced at least weekly. Inorganic and semi-volatile stock and working standards are retained for one year or to the time limit specified in the appropriate determinative method. All standards are frequently checked for degradation and evaporation and are replaced if a change has occurred. Solutions that have expired must not be utilized.

10.2.6 Other Quality Controls

Other samples may be utilized to monitor the quality of an analytical procedure. These samples include replicates, duplicates, calibration standards, calibration check or verification standards, continuing calibration check or verification standards (CCV), proficiency testing materials and specially prepared quality control samples.

A replicate is a second analysis of the prepared sample used to demonstrate the reproducibility of the analytical process. Replicates do not demonstrate the precision of the entire analytical method, but may be used to demonstrate precision of the instrumental analysis portion.

A duplicate is a second preparation and analysis of a field sample. Being essentially identical, the two samples can, when processed and analyzed together, demonstrate the precision of the entire analytical method or may be used to demonstrate the homogeneous distribution of analyte throughout the sample matrix. The utilization of duplicates to demonstrate precision is limited only by the degree of homogeneity between the duplicate samples. Certain methodologies or QA Project Plans may require the inclusion of replicates, duplicates, or other types of quality control samples in the analytical process. Duplicate analyses are performed at a rate of one pair per analytical batch as required.

10.2.7 Proficiency Testing for Laboratory Certifications

On-going proficiency testing is used to demonstrate the historical quality of an analytical process. Proficiency testing involves the processing of prepared samples from an external provider and is a requirement of certain laboratory certifications. ALS uses RTC as the external proficiency test provider for environmental testing. ALS participates in proficiency testing for Soils and Hazardous Waste Products and Wastewater Products (WP).

Sample materials are processed using the same procedures as field samples and analytical results are submitted to RTC within a specified time frame. ALS analytical results are then compared to the acceptability criteria used by RTC to assess data and a report is generated that identifies whether submitted laboratory results are within the acceptability values of the analyzed parameters. RTC forwards these performance summaries to ALS as well as to ALS's certifying bodies (NELAP). ALS's QA Manager posts the performance studies for laboratory personnel and then archives these studies. If ALS has unacceptable analysis results, the Section Manager for that area of testing investigates the nonconformance and either reruns the proficiency test sample if possible or, if deemed necessary, orders a quality control sample from RTC. When the root cause of the nonconformance is determined, the QA Manager forwards the corrective action records to the appropriate certifying agencies. For a current list of ALS's certifications and proficiency tests see Appendix 7 which also contains ALS's Proficiency Testing Plan.

10.3 Holding Times

Published methods may specify that field samples be extracted and analyzed within certain time limitations. Field sample results must meet holding times in order to be in compliance with the specific method requirements. Upon receipt, field sample documentation is reviewed to assure that proper holding time limitations are met. If the holding times have expired, the customer is contacted to determine a course of action. Holding times and container/preservation requirements are included in Appendix 8.

10.4 Sample Analysis

During the analysis of environmental samples, certain data are electronically generated, collected, and stored in computer files. This initial handling of the analytical data is accomplished using several sophisticated commercial software products specifically designed to operate with analytical instrumentation systems used in the laboratory. All data, including data generated in an electronic format, is maintained according to the laboratory procedure on Archive. Each analyst that generates electronic data is responsible for the archive of electronic data for their analysis. Other data, including pH measurements, titrations, gravimetric determinations and spectophotometric readings, are recorded in laboratory notebooks and transferred to the computer files via hand entry, for later processing. Data that is not derived electronically is copied and included in the archived data set.

Data from a few analyses, such as the analysis of asbestos by visual microscopy, are entered directly onto computer-generated report forms during the analytical process and copies of these forms are archived within the data set.

10.5 GC/MS Tuning Frequency Criteria

GC/MS instrumentation is tuned every 12 hours per criteria noted in the determinative methods. Field samples are not analyzed unless a successful tune is accomplished. Specific procedures regarding tuning are found in ALS internal GC/MS SOPs.

10.6 Measurement Uncertainty

All measurement processes contains a quantity of uncertainty that can be estimated. This uncertainty depends on the minor variances that are associated with the actual process, equipment, climatic conditions, etc. during the generation of each specific measurement. Measurement uncertainty does not imply doubt about the validity of the laboratory measurement, but attempts to quantitate the naturally occurring variation that occurs in every measurement process into a definable value.

Knowledge of the uncertainty associated with a specific analytical process implies increased confidence that the quantified result falls within a range of values given by the quantitated value and the expanded uncertainty established using historical quality control data. Some published analytical methods contain an estimate of the uncertainty associated with that method; however, for most analytical quantitative processes laboratory control sample (LCS) recoveries are used to generate expanded uncertainty values within the laboratory. This value in conjunction with the analyte quantitation of field samples helps to ensure the validity of the measurement result.

It is useful to recognize that measurement uncertainty of the laboratory data generated is likely to be much less than the uncertainty associated with the sample collection activities and the matrix of the samples. The estimation of uncertainty applied by the laboratory relates only to quantitative measurements conducted in the laboratory and does not relate to qualitative analyses performed. Uncertainty associated with sampling activities and related processes are not considered in the laboratory measurement uncertainty determination process. The measurement uncertainty value generated within the laboratory is considered the minimal uncertainty associated with the analytical process in a clean and interference-free matrix.

At the laboratory the expanded uncertainty for each analyte is calculated by multiplying the relative standard deviation of at least 20 quality control results by a factor of two. This corresponds to a confidence level of approximately 95%. The expanded uncertainty values reflect current laboratory values for each given analysis. These values can then be used to calculate the confidence interval of quantitated analytes in each method. Those analytes, which are not reflected specifically in the table, can be determined using the expanded uncertainty values of similarly performing analytes in the same analytical procedure and matrix. The 95% confidence interval for each analyte can be determined by:

95% Confidence Interval for Target Analytes:

$$\text{Range} = \text{Analyte Concention} \pm (\text{Analyte Concentration} \times \text{Expanded Uncertainty})$$

Expanded uncertainty values will change with time and as more and more data is accumulated. Updates of these values will be completed at least annually as required by laboratory procedure. It is the responsibility of each individual who utilizes these values to ensure that the appropriate current values are used for their data.

Updated copies of the expanded uncertainty values can be obtained from the Quality Assurance Manager.

10.7 Measurement Traceability

All equipment used that affects the quality of test results are calibrated before being put into service and on a continuing basis. These calibrations are verified through the use of reference materials traceable to NIST whenever possible (weights/masses, thermometers, chemical standards, etc.) or traceable to reputable vendors who provide traceability via Certificates of Analysis containing appropriate measurement uncertainty estimates (see SOP-GEN-016 "Procurement Control"). Written records are maintained that allow all analytical results to be traced unambiguously to the reference materials used for calibration.

11.0 DATA QUALITY ASSESSMENT

11.1 Introduction

The quality of all analytical data generated in the laboratory must be assessed (please see Criteria for Accuracy and Precision Section) before it is reported to the customer to ensure that it satisfies the customer's analytical requirements and the Quality Assurance Project Plan. Data packages are assessed for accuracy, precision, completeness, and comparability. A summary of ALS Quality Control Procedures is found in Appendix 9.

11.2 Data

Data generated through the analysis of field samples is not generally amenable to an evaluation of quality based on a direct assessment of the data itself. Accuracy, or the agreement between the reported value and the true value in the field samples, is unknown. Precision, or the refinement of the measurements of the sample property or analyte, is assessed from duplicate sample analyses and matrix spike/matrix spike duplicate pairs. An assessment of data quality based on the precision, or reproducibility, of the analytical result is of limited value if the true result is not known.

Matrix quality control samples, solvent (non-matrix) quality control samples, and surrogate compounds spiked into the field samples before processing for analysis, can be evaluated for both accuracy and precision. The assessment of quality derived from the quality control sample and surrogate data may be imparted to the field sample data, but care must be exercised in this assignment of quality assessment to allow for variability of field sample matrix effects.

11.3 Criteria for Accuracy and Precision

The accuracy of an analytical method can be represented as the percent recovery of the analytes of interest from a given matrix. The quality of data can be assessed through the comparison of individual data values, expressed as percent recovery, to quality control limits. Accuracy, or recovery, of historical data can be used to calculate quality control limits from the analysis of clean matrix quality control samples (LCSs), field matrix quality control samples (MS/MSDs), or surrogate spiked into field samples.

Precision is the refinement or reproducibility of a characteristic, or analyte, and can be represented as the mean of the relative percent difference of two analyte concentrations over a period of time. Precision can be determined from matrix spike quality control samples (MS/MSDs) or duplicate field sample analyses.

ALS maintains quality control charts that track both the accuracy and precision of sample analyses. These charts are updated at least annually. The spiking analytes used to generate the charting data are determined by method requirements. Charted data must be segregated by analyte, matrix type, and method of analysis.
Laboratory control limits are utilized for daily data control activities. In-house control limits are utilized for all analytical control activities, unless the calculated control limits become too restrictive for practical laboratory operation, as determined by the QC department in conjunction with the Laboratory Director and Section Management. In these cases, control limits may default to those limits found within the determinative method itself. Any deviations outside of the applicable control limits must be investigated and appropriate corrective action initiated.

Control data collected at ALS are normalized to the appropriate target value so that they are presented as percent recovery. This allows for ease in comparing data with EPA published results. Except for data attributed to a documented error that invalidates the data (such as double spiking or no spiking of the target analytes in control sample preparation), all data points are included in the calculation of control limits. Control limits are calculated when at least 20 data points have been collected to provide an accurate estimate of the total data population.

The mean and standard deviation of the data are calculated, utilizing individual data points as appropriate and/or the average of pairs of duplicate data. Accuracy control limits are set at plus and minus three standard deviations from the mean. Warning limits are set at plus and minus two standard deviations from the mean. Precision control limits are calculated for duplicate data from the range of data pairs.

Accuracy-$\overline{X}$ chart algorithms:

Central Line or Mean ($\overline{X}$):	$\frac{X_1 + X_2 + X_3 + \ldots\ldots + X_n}{n}$
n:	Number of data points used as subset of data population.
$X_1, X_2, \ldots X_n$	% Recovery of each data point
Standard Deviation (s):	$\sqrt{\frac{\sum (X_i - \overline{X})^2}{n-1}}$
Control limits:	$\overline{X} \pm (3 * s)$
Warning limits:	$\overline{X} \pm (2 * s)$

Precision-R bar charts.

Central Line ($\overline{R}$):	$\frac{R_1 + R_2 + R_3 + \ldots\ldots + R_i}{n}$
n:	Number of data points used as subset of data population.

R: (RPD)	$\left\lvert\frac{(V_1-V_2)}{(V_1+V_2)/2}\right\rvert$
V_1 and V_2:	% Recovery of Duplicate Analyses.
R_1, R_2,. . .R_n:	Average % Recovery of each data point
Standard Deviation (s):	$\sqrt{\frac{\sum(R_i-\overline{R})^2}{n-1}}$
Control limits:	$\overline{R} \pm (3.267 * s)$
Warning limits:	$\overline{R} \pm (2.512 * s)$

11.4 Evaluation of Data Trends

Quality control data for an individual analysis must first be evaluated against control limits. Assuming that data meet control criteria, the data from the analysis of several successive analyses must also be evaluated for possible trends. While a trend is not necessarily an out-of-control condition in itself, it can be indicative of a condition that could cause an analysis to become out of control. Trends are recognized if one or more of the following situations exist:

- A series of seven successive points on the same side of the mean
- A series of five successive points going in the same direction
- A cyclical pattern of points
- Two consecutive points between warning limits and control limits
- A single QC value outside of control limits

The occurrence of a trend does not invalidate data that is otherwise within control limits, but does require investigation to determine if there is an assignable cause for the trend. Items to be addressed include, but are not limited to, the following:

- What conditions have changed since the trend began?
- Has this trend appeared before? If so, was there a corrective action?
- Has there been a change in instrumentation or personnel?
- Have standard or QC solutions been changed?
- Have method reagents been changed (provider, brand, lot, concentration, etc.)
- Has instrument maintenance been properly performed?
- Has there been an extremely difficult matrix analyzed lately which may have lingering effects?

11.5 Criteria for Other Quality Parameters

The quality parameters of completeness and comparability include factors that are beyond the control of the analytical laboratory. ALS can address these parameters to the extent that they apply to the analysis of samples and the reporting of data.

11.5.1 Completeness

The completeness of laboratory analytical data refers to two items: (1) that all samples and analyses required by the customer and/or the applicable Quality Assurance Project Plan have been processed and (2) that complete records exist for all of the analyses performed and the associated QC samples.

The Data Quality Objectives (DQOs) presented in Quality Assurance Project Plans usually specify a level of completeness required for the analytical data. The parameter of completeness can also be applied to each individual sample report. ALS's level of completeness in regard to the number of samples processed is equal to 100% unless specified otherwise by the customer.

If associated quality control sample analyses are found to be unacceptable, then a laboratory investigation and corrective actions may be initiated, per the standard laboratory operating procedure. If the outlying results cannot be resolved upon completion of corrective actions, the customer is advised of the situation. Technical direction is provided to the customer by ALS to aid in resolution of the outlying data. This approach is utilized by ALS to take into account interfering sample matrices and other analytical hindrances that may be beyond the control of the laboratory.

ALS requires that all field sample data, quality control data, and documentation must be present, or the location of the information must be referenced, in the data package. All final reports must contain the necessary field sample data, and, if applicable, sample conditions upon receipt and quality control data.

11.5.2 Comparability

While ALS cannot control the relationship of a field sample to the sampling site, the laboratory is responsible to assure that sample splits, particularly in the case of soil or other heterogeneous matrices, are prepared such that the portion analyzed is comparable to the field sample submitted.

Comparability is also a requirement that analytical data be consistent in quality across all time periods of a project. This requires that quality control criteria and analytical procedures be consistent.

12.0 CORRECTIVE ACTION

12.1 Introduction

Laboratory operations are governed by documented procedures, requirements, quality assurance plans, and contracts. When any operation, for any reason, does not conform to the requirements of the governing documents, the nonconforming item, or situation must be properly documented and evaluated. If necessary, appropriate corrective action measures must be initiated. Detailed procedures for the documentation and resolution of nonconforming issues are outlined in the laboratory standard operating procedure entitled "Nonconformance/Corrective Action/Preventive Action."

12.2 Responsibility

It is the responsibility of each individual employee who detects a nonconforming situation to initiate documentation of such on a NC/CAR form (Appendix 10). The reporting of nonconformities does not require approval from any supervisory personnel. However, the initiator is responsible for following the documentation and distribution procedures as specified by SOP- QA-NC/CAR- "Nonconformance/Corrective Action". Once initiated, the appropriate manager and/or quality assurance must address a NC/CAR report. Section Managers, along with Quality Assurance, are responsible for determining the extent of the nonconformance, and the initial level of corrective action response. Some events are not amenable to corrective action, although they are not in conformance with a procedure. A broken sample container with no additional sample available is a typical example of this. Other situations require documentation in the data package, without initiation of the formal NC/CAR. The decision of the Section Manager is subject to review and concurrence by the Quality Assurance Manager and/or the Laboratory Director. Section Managers, QA Manager, or the Laboratory Director are also responsible for any necessary notification of the customer when relevant nonconforming items occur.

The Quality Assurance Manager is responsible for maintaining documentation of nonconforming events, and for reviewing the decisions made by laboratory management in the resolution of an event. In accordance with SOP procedures, follow-up inspections of all corrective actions are performed to assure that the actions have been effective. If corrective actions are not implemented, the Laboratory Director is notified and is responsible for the resolution of the issue.

12.3 Nonconformance Criteria

An item, event, or procedure is considered to be nonconforming when it is compared to the governing documents or criteria and is found to be unacceptable by the parameters of that document or criteria. The presence of spurious contamination in a blank is an example of a nonconforming event. Spurious contamination is often detected in a procedure which is capable of detecting the presence of compounds at concentrations at and below parts per million. The criteria for determining whether the detected compound is considered a contaminant is based on the detection or reporting limit established for the analyte/method/matrix system in the applicable Quality Assurance Project Plan or contract. Generally, if the compound is above the criteria limit, it is reportable as a contaminant.

Analytical data, especially data this is derived from the analysis of surrogates or QC samples, is subject to comparison with quality control limits. The control limits can be established by the applicable analytical method, Quality Assurance Project Plan, a contract, or can be based on laboratory data. In either case, the criteria for acceptance of data are based upon more than simple comparison with control limits. Data outside of control limits may be acceptable. Data inside of control limits may indicate a potential method control problem. Control criteria are used as aids in detecting nonconforming data. Decisions of acceptability of data must be made in a relationship to the full analytical procedure, and with the insight gained from performing some degree of a root cause analysis investigation.

12.4 Root Cause Analysis

The immediate condition or action, which caused a nonconforming event or situation to occur, is often obvious to experienced laboratory personnel. However, the obvious cause may not be the real or root cause. The event may have been part of a sequence of events. A specific change in physical conditions, procedure, or administration may have precipitated the event. The event may have occurred because of the failure of a physical or administrative barrier designed to prevent such a nonconforming occurrence. Before the obvious is accepted as the cause of a nonconformance, a root cause analysis is performed. This may be formal, involving several personnel and considerable time, or informal, consisting of the investigations of one or two people. In either case, the investigation must be thorough and any necessary documentation must be completed and attached to the NC/CAR reporting form.

12.5 Corrective Action

When a nonconformance has been characterized, and the cause satisfactorily determined, a plan of corrective action must be devised and implemented with the purpose of eliminating, or at least severely restricting, the chance for recurrence of the nonconformance. Nonconformities, which are essentially the result of random error, may not be amenable to specific corrective action. They must nevertheless be documented.

Nonconformities, which are determined to be the result of more than a simple random error and which are determined by root cause analysis to have an identifiable precipitating cause, must be responded to with an appropriate corrective action. This corrective action must be directed at the root cause.

Analytical and control data, when compared with control limit criteria, must be evaluated in the context of the entire method and associated data, including instrument performance, laboratory procedures, sample matrix effects, analyst performance, etc.

In some instances, a nonconforming event can be brought into conformance as part of the routine daily procedures associated with the analytical or administrative process. The training of analysts at ALS instills knowledge of quality control procedures and allows the analysts the authority to perform necessary corrective actions at the “bench level”.

Reviews of instrument performance, standard curves, and raw data are incorporated into the initial data review routinely performed by all analysts. Reviews of these and related items may cause immediate correction by the analyst with no further need for corrective action. Original findings are recorded and maintained with the data package with any necessary explanations and notations. However, systematic errors discovered by the analyst may be cause for further investigation and are brought to the attention of the section supervisor for initiation of a corrective action report.

The following table is a sample list of possible nonconforming events and corrective actions that may be initiated to bring the events back into a controlled system. Appendix 10 contains a list of detailed corrective actions for analytical methods and system reviews. Detailed procedures are also included in the laboratory standard operating procedure for nonconformities/correction actions and the specific method SOPs.

Event	Corrective Action
Calibration outlier	Recalibrate
Instrument malfunction	Perform corrective maintenance, if possible, and, if not, remove instrument from use by physical means or clearly tagging the specific equipment to prevent inadvertent use.

Internal system audit findings	Issue nonconformance/corrective action report (including review of and possible corrections to system). Upon completion, report must be approved by QA.
External system audit findings	Reply to third party findings as required by their procedures. QA and Lab Director must approve all corrective actions.
Performance evaluation audits (proficiency tests)	Issue nonconformance/corrective action report (including review of and possible corrections to system). Upon completion, report must be approved by QA.

12.6 Corrective Action Follow Up

The Quality Assurance Manager has the responsibility of conducting follow up audits of initiated corrective actions. Typically, two weeks after a corrective action is initiated, the QA Manager verifies that the documented corrective action has been implemented, that the corrective action is successful and close the corrective action report. If the corrective action has not yet been implemented, the Laboratory Director is apprised of the situation and is responsible for resolution. If the corrective action does not successfully address the nonconformance, a new investigation and corrective action is initiated. Another follow up audit is scheduled to assess the success of the attempted actions to resolve the initial issue. The follow up audit takes into account the amount of time that may be required to perform the necessary corrective actions.

12.7 General Procedures

In the event of a nonconformance, a nonconformance/corrective action record may be generated. The analyst, Section Manager, or Quality Assurance, may initiate this record then forwards the original copy to the QA Manager. QA, in conjunction with the Section Manager, assigns personnel to perform the actions necessary for correcting the problem. The record is then returned to QA for approval and follow-up review. Upon satisfactory completion of the corrective action, the record is deemed closed and the NC/CAR form along with any pertinent documentation is archived by QC. A copy of the NC/CAR is retained in the QC Office for archive purposes.

Typical steps to be taken when investigating a nonconforming analytical event (i.e. QC sample outlier) include:

1. Check all data processing procedures and calculations.

2. Check blank samples for identification of possible interferences or other problems.
3. Check instrument performance (if applicable) by observing the response of the instrument while processing a sample material for which the expected response is known. Operating conditions must be similar to those used for analysis of the samples under consideration.
4. Check the original standard preparation procedures by preparing new standards, obtaining a new standard calibration curve from the new data, and comparing the new standard curve with the original standard calibration curve.
5. Check the integrity of the original QC samples by preparing new QC samples following the same procedures and analyzing the new QC samples.
6. Carefully review raw data (e.g., recorder output, chromatograms, computer output) in an effort to identify interferences, unusual signals (unusual peak shapes, etc.), or other factors which could produce inaccuracies.
7. Reanalyze the samples with new standards and new QC samples. The entire analytical process, including preparation, is repeated if sufficient sample volume is present.
8. If QC results are still unacceptable and no reason has been identified after completing Step 7, discuss the problem in detail with the customer and determine how results should be reported. Data flags may be required to identify nonconformities present in sample results.

12.8 Preventive Actions

Preventive actions are a pro-active process to determine the areas where potential improvements can be made to reduce the likelihood of future problems or complaints. Preventive actions may originate with any member of the laboratory, from analyst to Laboratory Director, and are brought to the attention of Quality Assurance for inclusion in the next management review meeting agenda. Preventive actions can result from needed changes as instrumentation or procedures become outdated, as newer technology is created to improve the laboratory's throughput and data quality, or as a result of trends identified during control charting or data analysis/review, etc. Once issues are identified for possible preventive actions and Quality Assurance is informed, the issues are added to the next management review meeting agenda maintained by Quality Assurance. The issue is discussed in the management meeting, including possible benefits and costs, and an action plan is formulated. Following the reception of all required supporting information from the action plan, the Laboratory Director is responsible for determining the overall need for the proposed preventive action, for assigning personnel to perform the preventive action tasks, and for determining the time frame in which the duties will be completed. Preventive action documentation may be maintained as minutes in management review meetings or may require further documentation as determined by the Laboratory Director.

If the situation becomes an actual nonconformance or the result of nonconformities prior to the resolution of the preventive action; the preventive actions taken must be assistive, but the issue is then addressed using the procedure for nonconformance/cause analysis/corrective action and that procedure must take precedence over the preventive action activities.

13.0 INTERNAL AUDITS, ACCREDITATIONS, AND CERTIFICATIONS

13.1 Introduction

The goal of the ALS internal auditing program is to assure laboratory compliance of the analytical system with the written laboratory standard operating procedures, Quality Assurance Plans, and certification requirements, including auditing pertinent laboratory sections to the ISO 17025 standard. Audits consist of inspections and surveillance of both laboratory procedures and documentation. The quality assurance department performs internal audits of each laboratory section on at least an annual basis to verify compliance to the established procedures.

In addition to audits of the laboratory system performed by the ALS quality assurance department, second and third party audits are regularly performed within the laboratory.

13.2 Performance and System Audits

Continuous performance auditing is accomplished through the regular use of Laboratory Control Samples (LCS), matrix spike samples, duplicate samples, QC samples, proficiency testing and through continuing calibration verification samples. ALS uses Sigma Aldrich (formerly RT Corp.) as the external proficiency test provider for environmental testing.

Management reviews involve the examination of data handling, documentation, training records, and other supporting systems within the laboratory.

System audits are performed as described in the laboratory standard operating procedure for internal auditing or as required by accreditation authorities.

The ALS QA Section maintains results of internal audits. Upon completion of an internal audit, a copy of the audit report is forwarded to the relevant laboratory management and the Lab Director. If necessary, nonconformance reports may be initiated and corrective action records are initiated to address audit findings.

13.3 Certifications

ALS is certified, validated, or approved to perform field sample analyses by a variety of different states and agencies. Appendix 7 lists those states and agencies that have approved ALS and the performance evaluation studies in which ALS participates.

14.0 DOCUMENT CONTROL AND RECORDS MANAGEMENT

14.1 Introduction

Laboratory documents and records define the operation of the laboratory and chronicle the activities associated with the analytical process. The management and control of these documents and records are necessary to assure that laboratory data are of known quality, retrievable, reproducible, and, ultimately, legally defensible. The records management system at ALS controls the preparation, approval, distribution, and revision of procedures used in the laboratory, and the retention, retrieval, and disposition of laboratory data records. Records and documents that must be maintained, controlled, or managed include sample receiving and chain-of-custody records, sample analysis data records, instrument maintenance records, quality control data, quality assurance documents, reference methods and procedures and all other records that relate to or impact upon the quality of the analytical data.

Document control and records management is implemented through several specific laboratory standard operating procedures- DCLC-SOP-009- “Data Record Keeping” and QA-009- “Quality Document Preparation and Control”. Specific contract requirements may supersede the requirements of the SOPs and are delineated in the project specific quality plans.

14.2 Responsibilities

14.2.1 Laboratory Records

The Quality Assurance Section is responsible for the retention, retrieval, and disposition of final records of laboratory data and activities. This includes completed data packages, completed analyst laboratory notebooks, completed instrument logs, and training records.

14.2.2 Standard Operating Procedures

The Quality Assurance Section is responsible for the retention, distribution, and control of standard operating procedure documents.

14.2.3 Reference Methods

The Quality Assurance Section is responsible for the distribution and control of external reference procedures and methods.

14.2.4 Records of Audits, Nonconformance Corrective Action Reports, and Management Review

The Quality Assurance Section is responsible for maintaining and retrieving records of all audits, both internal and external, nonconformance and corrective action records, and management review records. These records are placed on a shared network drive for all employees, however, the original signed copies are located on the QA office computer.

14.2.5 QA Program Plans

Internally generated Quality Assurance Program and Project Plan documents are maintained and distributed by the Quality Assurance Section.

14.3 Document Control

Standard operating procedure documents, ALS Quality Assurance Program Plans, reference methods and data packages are maintained under laboratory document control procedures. Other documents that are controlled and tracked include analyst notebooks, instrument logbooks, standards preparation logbooks, instrument hard-copy output, and analytical reports. Controlled documents may be assigned to personnel, a laboratory section, or the applicable instrumentation. Personnel must sign for the document, indicating receipt, and are charged with replacing outdated sections of the old document with updates, if necessary. Some of the internal documents such as SOP's and QAPP's (unsigned) are located on a shared network drive.

14.3.1 Standard Operating Procedures

SOPs are written as described by laboratory procedure. Generally, SOPs written to describe management systems conform to the following format, although exceptions to this format are acceptable to accommodate particular requirements of specific projects or programs.

1.0 Purpose of the Document
2.0 Scope and Area of Application
3.0 Responsibilities of Specified Personnel
4.0 Referenced Documents; e.g., Analytical Methods, Instrument Operational Instruction Manual, and Regulations
5.0 Procedural Requirements; e.g., equipment, reagents, materials, and forms
6.0 Procedural Details
7.0 QA/QC Requirements, including Precision and Accuracy Statements
8.0 Definitions or Calculations Applicable to SOP
9.0 Documentation Requirements

10.0 Appendices

SOPs addressing analytical methodology are written to conform to the following format although exceptions to this format for analytical methodology are acceptable to accommodate particular requirements of specific projects or programs.

1.0 Scope and Application
2.0 Safety Precautions
3.0 Sample Handling and Preservation
4.0 Reporting Limits
5.0 Interferences (if applicable)
6.0 Apparatus
7.0 Reagents
8.0 Calibrations
9.0 Sample Preparation
10.0 Diagrams or Tables (if applicable)
11.0 Procedure
12.0 Calculations
13.0 Quality Assurance Provisions
14.0 Reporting Results
15.0 Preventive Maintenance
16.0 References
17.0 Appendices (if applicable)

14.3.2 Data Packages

All of the documentation that pertains to the analysis of a sample or group of samples being reported together must be gathered together as a data package. As analytical subsets are completed, the information is faxed to the appropriate customer and the subset is placed in established locations within the laboratory. When analysis has been completed for the data set, or all subsets, laboratory personnel assign a cost per analysis and sample and calculate the total analytical cost for the data set. Data sets are then transferred to the accounting section for invoice generation, report mailing, and filing in the appropriate archive location. ALS data packages are designed to include all applicable raw data and to be tailored to meet the specific requirements of customers. However, documents such as the report, Chain of Custody or Analytical Request Form, Emails and notes concerning special customer requests, Affidavits, Invoices, etc. are in LIMS for every work order.

A data package can include any or all of the following:

- Chain of Custody or Analytical Request Form
- Instrument raw data

- Copy of lab notebook page that contains standards and prep information
- Peer Review Checklists (required for OH VAP projects)

The data are reviewed and validated for accuracy and completeness upon completion of the sample analysis. The reviewer has responsibility of assuring that the pertinent items are present, complete, and accurate in LIMS and in the data package and allow for proper retrieval of the analytical data.

14.4 Revision/Retiring of Standard Operating Procedures

ALS Section Managers have the responsibility of reviewing SOPs relevant to their section and for presenting necessary revisions to the Quality Assurance Section. If justified, a minor or major revision to the SOP is initiated by tracking changes with red strikeout deletions and blue underline additions. Controlled copies of the document are then amended or replaced on a shared network drive (See QA-009, “Quality Document Preparation and Control” for more information on computerized documentation control). When necessary, an SOP may be retired. The SOP is stored in the electronic SOP archive folder for future reference (SOP-QA-004-“Archives”).

Revisions to SOPs that govern Ohio VAP certified processes require Ohio VAP approval prior to implementation within the laboratory. When revisions to these procedures are required, the proposed revisions are submitted to Ohio VAP by the QA Manager. The revisions proceed through a technical review by the Ohio VAP program and are then approved for implementation. Following the receipt of Ohio VAP approval, the documents are submitted to laboratory management for signatures.

14.5 Approval of SOPs

Approval of SOP documents is necessary before SOPs are implemented into the laboratory. Signatures of the Laboratory Director, Section Manager, and QA Manager are required for all new technical SOPs. Signatures are maintained on the SOP approval sheet, located at the front of the procedure.

General laboratory procedures may not require Section Management signatures. In that case, implementation occurs with the signatures of the Laboratory Director and the QA Manager.

14.6 Records Retention

The primary records retention activity of the laboratory concerns the preparation, initial storage, archiving, retrieval, and disposition of laboratory data packages. The analyst compiles all records, or copies of records, which relate to the analysis of field samples, into data packages. These data packages are initially stored, generally categorized according to Work Order Number allowing easy retrieval for review. Following initial storage data packages are archived for at least ten years. Project specific or certification requirements may supersede this procedure.
After ten years of record storage, the laboratory must notify the OH VAP program in writing of the lab's intent to dispose of any records for OH VAP projects and provide the agency the opportunity to obtain these records. These records must be retained until the agency notifies the laboratory in writing that it will or will not obtain the documents and data. Other laboratory records, including notebooks and logbooks, are retained permanently by ALS, and are not released to customers. In the event that the laboratory goes out of business or transfers ownership, records are maintained by ALS or transferred according to clients' instructions. In case of bankruptcy, the appropriate regulatory and state legal requirements regarding laboratory records will be followed.

14.7 External Documents

External documents such as Policy Manuals from Certification Bodies (AIHA, ISO/IEC 17025:2005, Ohio VAP, etc.) as well as software and instrumentation manuals also must be identified for control. These documents are identified on the External Document Control and Distribution List that is located on the shared network drive. This list is maintained by QA/QC and includes the document's location in the laboratory.

15.0 CONFIDENTIALITY AND COMPLAINTS

15.1 Customer Confidentiality

Customer confidentiality is addressed in the SOP, "Customer Confidentiality", GEN-012. ALS makes every effort to maintain customer confidentiality in every phase of the analysis process from sample receipt through archive. Sample information is placed in a file folder upon receipt to protect customer information from being inadvertently observed by other customers coming into the area. Analysts are prohibited from discussing customer information with other parties outside the laboratory. On-site assessors from customer's facilities are prohibited from examining any documentation in regard to information regarding other customers.

Independent accreditation auditors may examine any documentation that is necessary to determine laboratory compliance with the pertinent certification standard.

15.2 Complaints

The ALS procedure regarding customer complaints is GEN-010 "Client Services". If customers have complaints regarding data reporting, interpretation, methodology, or billing, the ALS policy on handling customer complaints are as follows:

1. The appropriate Section Manager, in coordination with the analyst and the Quality Assurance Manager, handles problems with analyses or reported results.

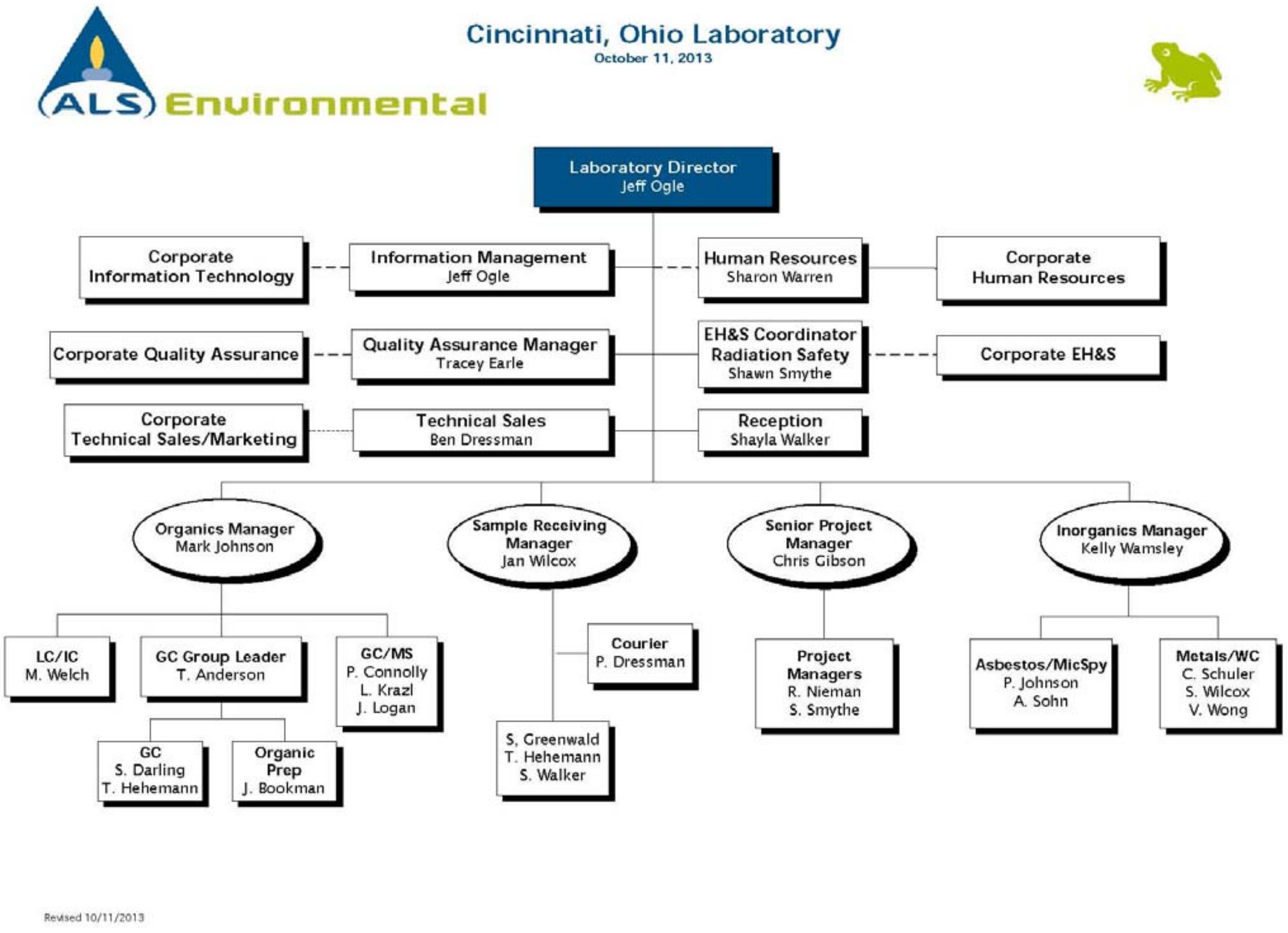
2. The appropriate Section Manager, in coordination with the Laboratory Director, handles problems with analytical turn-around time.

3. The appropriate Section Manager, in coordination with the sales department and accounts receivable, handles problems with billing and invoicing.

Every effort is made to resolve the problem to the customer's satisfaction. In the event that there is a substantial disparity between the customer's demands and ALS policy, the issue is submitted to the Laboratory Director for resolution. All complaints associated with results or QC problems are examined closely and a QA/QC Corrective Action record may be completed.

Internal complaints in the laboratory must also be acted upon to ensure that employee concerns are addressed and that a resolution can be reached to benefit both the employee and the laboratory, when possible. With this goal, a grievance committee, that includes a member from every level of laboratory organization, has been established. Concerns are submitted using the comment box located in the conference room. Employees can submit their concerns, anonymously, and the committee determines the severity of the concern and possible remedies. Every effort is made to resolve the problem to the employees' satisfaction, but when complaints surpass the authority of the committee, the Laboratory Director is apprised of the situation and determines the final disposition.

Appendix 1.0: ALS ORGANIZATION CHART *(subject to revision without notice)*



Cincinnati, Ohio Laboratory
October 11, 2013

Appendix 2.0: ALS FIELD CHAIN-OF-CUSTODY

Field Chain-of-Custody Record

☐ **REGULAR** Status ☐ **RUSH** Status

Page_____of_____

Cooler Temp: ______
(Lab only)

11601

Date ________ Purchase Order No. _______________
Company Name _________________________________
Address _____________________________________
City State Zip
Person to Contact _____________________________
Email Address _______________________________
Telephone (   ) ___________________________
Fax Telephone (   ) ________________________

Billing Address (if different)
Project No. ________________________
Sampling Site ______________________
Date/Time of Collection ______________
VAP ☐ Yes ☐ No

Sample Number	Site ID	Date	Time	Lab Sample Number	Preservation	Sample Type	Analysis Requested									No. of Containers

Notes:

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*.

Relinquished by: *(Signature)*	Time / Date	Received by: *(Signature)*	Time / Date
Relinquished by: *(Signature)*	Time / Date	Received by: *(Signature)*	Time / Date
Relinquished by: *(Signature)*	Time / Date	Received by: *(Signature)*	Time / Date

Ship to: **ALS Environmental**
4388 Glendale - Milford Road
Cincinnati, Ohio 45242
Phone: 513.733.5336
Fax: 513.733.5347

Carrier / Airbill #

Date / Time:

ALS GROUP USA, CORP. Part of the ALS Group A Campbell Brothers Limited Company

Environmental www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Appendix 3.0: PREVENTATIVE MAINTENANCE SCHEDULE AND PARTS LIST

Appendix 3.0: Preventative Maintenance Schedule and Parts List

Instrument	Items Checked/Serviced	Frequency	Critical Spare Parts
Mercury Analyzer	Optical lenses	As needed	Tubing, cartridges.
	Instrument Zero	Before each use	
Analytical Balance	Internal weight, train, gears, electronics	As needed, but at least annually	None
Inductively Coupled Plasma Spectrophotometer	Sample introduction system (aspirator)	Daily, as needed	Torches, nebulizers, pump tubing, torch collars (bonnets) Syringes, columns
	Check pumps and tubing	Weekly, as needed	
	Clean nebulizer	As needed	
	Clean sample probe	Monthly	
	Check plumbing	Daily or as needed	
Ion Chromatograph	Check filter (inlet)	Weekly	None
	Flush column	After each new sample	
	Check bed support	When specifications are off	
	Clean cells	As needed	

Instrument	Items Checked/Serviced	Frequency	Critical Spare Parts
Fourier Transform Infrared Spectrophotometer	Desiccant Check Desiccant Replacement Background Adjustment Polystyrene Test Spectrum Clean cells	Weekly At least every 6 months Daily As needed during qualitative analyses. As needed	Desiccant, Toner, Printer Paper, Replacement cells
pH Meters	None	None	None

Instrument	Items Checked/Serviced	Frequency	Critical Spare Parts
Ultraviolet (UV/VIS) Spectrophotometer	Lamp and wavelength check or serviced	As needed or during calibration steps of when used	Replacement cells
	Wash, rinse, and dry cells	Each use	
GC/MS	Replace column, clean ion source, replace filaments	Determined by analyst so that response and the calibration are within required specifications	Septa Single taper injection port liners & seals Ferrules Columns Syringes Filaments Toner Cartridges O-rings
	Check pump fluid	Weekly	
	Replace pump fluid	Every 6 months	
	Replace pump pellets	As needed	
	Printer maintenance	As needed	
	Clean instrument area	As needed	
	Autosampler maintenance (SVOA GC/MS systems only)	As needed as determined by analyst	
	Change septum (SVOA GC/MS systems only)	As needed as determined by analyst	
	Injection port maintenance (SVOA GC/MS systems only)	As needed as determined by analyst	

**Flushing HPLC system:* After each use of a buffer of modifier, the HPLC system flushed with 20 milliliters water then 10 ml 50/50 (acetonitrile or methanol/water). The column may be included in this flushing if applicable.
**Water Mobile Phase:* Before each use of the HPLC system, the water last used must be replaced with fresh DI water in order to avoid bacteria that may have formed in the old water.
Repairs: All replacement of lamps, seals, or other parts are performed according to the manufacturer's instructions.

Instrument	Items Checked/Serviced	Frequency	Critical Spare Parts
HPLC*	Detector lamps	If baseline is unstable or has excessive noise without flow through the cell	Pump seals Switching valve seals Check valve seals (inlet and outlet) Lamps
	Pump seals, check valves, inlet frits Switching valve seals, injection volume metering device seals	If HPLC system pressure becomes unstable while flow is isocratic	Columns Tubing Ferrules/nuts
		If replicate injections are less than 95% of each other where chromatography is not in question	
Gas Chromatograph	Replace column or column packing, clean detector, clean or replace injection port liner.	Determined by analyst so that response and the calibration is within required specifications	Column ferrules Injection port liners and O-rings Autosampler syringes Deactivated glass wool
	Replace septa	Weekly, if needed as determined by analyst	Columns Column packing Injection port septa Detector igniters
	Replace incoming gas drying cartridges	When color change is observed	PID Lamps Moisture traps Oxygen traps

Appendix 4.0: INSTRUMENTATION LIST

Instrument	Manufacturer	Model	DCL/ALS Property #	Year Purchased	Location
Gas Chromatography					
GC ECD/ECD System	Hewlett-Packard	6890	108487	1999	GC Lab
GC FID/TCD System	Hewlett-Packard	6890	108502	2000	GC Lab
GC ECD/FID System	Hewlett-Packard	6890	108158-59, 104261	2004	GC Lab
GC FID/FID System	Hewlett-Packard	5890 II	108465	1997	GC Lab
GC NPD/FID System	Varian	3400	104461	1992	GC Lab
GC PID/FID System	Tracor	9000	101366	1990	Purge & Trap
GC Purge & Trap Concentrator	Tekmar	3100	108669	2002	Purge & Trap
AutoSampler	Varian	Archon	101788	2007	Purge & Trap
3 Hoods Org. Ext. Lab			109118 (#1), 109119 (#2) 103113 (#3)	1988	Ext. Lab-Organics
GC FID System	Agilent Technologies	Model 7890A-S/N: CN10101143	109059	2010	GC Lab
GC FID System	Agilent Technologies	Model 7890A-S/N: CN10191113	109060	2010	GC Lab
GC Dual ECD System	Agilent Technologies	Model 7890B-(G34408) SN:CN13103057	109403	2013	GC Lab
1 Hood GC Lab			109120		GC Lab
Organic Extractions					
Balance, Top loading	Sartorius	R200S (U5000D)	101175	1989	Organic Extractions
Concentrator	Organomation	NEVAP-112	101400	1990	Organic Extractions
Sonics and Materials	Vibra Cell		109400	1990's	Organic Extractions
Tumbler			101846		Organic Extractions
Soxlet Extractor	Barnstead Electrothermal Extractor		101847		Organic Extractions
Drying Oven	Yamato	DVS600	101848		Organic Extractions

Thermometer for Tumbler	Fisher		109263	2011	Organic Extractions
Labmax 10 mL Dispenser	VWR Labmax	82017-766	109265	2012	Organic Extractions
Troemner 30 g wt Ultra Class	Troemner	1000066030	109316	2012	Organic Extractions
MARS 6 Microwave	CEM Corp.	910900	109505	8/7/13	Organic Extractions
Cart for MARS 6 Microwave	ULINE		109506	8/7/13	
Liquid Chromatography					
HPLC UV/VIS System	Dionex	Summit System	108171, 108173, 108668,109002	2005	Instrument Lab
HPLC UV/VIS/Flour. System	Dionex	System	108164-66, 108172, 109001, 109002, 105674	2001	Instrument Lab
HPLC UV/VIS System (can be used as IC or HPLC)	Dionex	ICS-1100 S/N# 10040355 & UV Detector Model VWD-1 S/N#10040795, pneumatic controller PC10	109056, 109057, 109408, 109000	2010	Instrument Lab
Ion Chromatograph	Dionex	System	108167-68	2004	Instrument Lab
Hood IC/HPLC	Labconco		101845	2009	Instrument Lab
Interface	PE Nelson	900 Series Interface	109409		Instrument Lab
Pippette 100-1000uL (.1-1 mL)	Eppendorf-Research Plus Variable Vol.	H67591B	109281	2012	Instrument Lab
Mass Spectrometry					
Balance, Top Loading	Denver	MXX-212	101833	2008	Volatiles Lab
GC/MS/DS System	Hewlett-Packard	5973/6890	108461/ 62, 101368/80	1998	Volatiles Lab
GC/MS/DS System	Hewlett-Packard	5973/6891	108481/108482	1999	Volatiles Lab
GC/MS/DS System	Hewlett-Packard	5973/6890	108141/42	1998	Instrument Lab
GC/MS/DS System	Hewlett-Packard	5973N/6890N	108163-108166	2004	Instrument Lab
Gas Chromatograph (MSD)	Agilent	5973N/6890N	101766	2007	Volatiles Lab
Gas Chromatograph (MSD)/GC System	Agilent Technologies	5975C inert XL MSD/GC System 7890A (with 7693 AutoSamp.)	109106/109107	2011	Instrument Lab
Pre-Concentrator	Entech	7100A	101761	2007	Volatiles Lab
Canister Autosampler	Entech	7016A	101762	2007	Volatiles Lab
Canister Cleaner	Entech	3100A	101764	2007	Volatiles Lab

Canister Oven	Barnstead	3513ENT	101765	2007	Volatiles Lab
AutoSampler	Varian	Archon	108175, 108177	2003	Volatiles Lab
Sample Concentrator	Tekmar Dohrmann	3100	108176, 108178	2003	Volatiles Lab
Sample Concentrator	Tekmar	3100	108483	1999	Volatiles Lab
Sample Concentrator	EST Purge and Trap Conc.	Encon Evolution	109108	2011	Volatiles Lab
Flow Controller (stainless)	Restek	24167	101789-10793	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339495	101819	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339405	101820	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339427	101821	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339429	101822	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339432	101823	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339434	101824	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339490	101825	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339512	101826	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339534	101827	2007	Volatiles Lab
Flow Controller (stainless)	Restek	7339857	101828	2007	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109160		Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109122	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109123	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109124	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109125	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109126	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109127	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109243	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109244	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109245	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109246	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109247	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109248	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109249 chg. To 109402	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109250	2012	Volatiles Lab

Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109251	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109252 chg. to 109401	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109253	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109254	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109255	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109256	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109257	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109258	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109259	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109260	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109261	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109262	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109267	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	No manufacturer serial #	109268	2012	Volatiles Lab
Soil Gas Flow Controller (stainless)	Entech- 1/4" Sample Train	Entech Item#01-39-64650	109348-109355	2013	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5342	109128	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5341	109129	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5340	109130	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5339	109131	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5338	109132	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5337	109133	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	5336	109134	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11243	109135	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11244	109136	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11245	109137	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11246	109138	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11247	109139	2011	Volatiles Lab

Soil Gas Flow Controller (stainless)	Restek	11248	109140	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11249	109141	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11251	109142	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11252	109143	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11253	109144	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11254	109145	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11255	109146	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11256	109147	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11258	109148	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11259	109149	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11260	109150	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11261	109151	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11262	109152	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11263	109153	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11264	109154	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11265	109155	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11266	109156	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11267	109157	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11268	109158	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	11269	109159	2011	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	101620	101794	2007	Volatiles Lab
Soil Gas Flow Controller (stainless)	Restek	101621	101795	2007	Volatiles Lab
Summa Cans	Restek	101622	101796	2007	Volatiles Lab
Summa Cans	Restek	101623	101797	2007	Volatiles Lab
Summa Cans	Restek	101624	101798	2007	Volatiles Lab
Summa Cans	Restek	101625	101799	2007	Volatiles Lab
Summa Cans	Restek	101626	101800	2007	Volatiles Lab
Summa Cans	Restek	101627	101801	2007	Volatiles Lab
Summa Cans	Restek	101628	101802	2007	Volatiles Lab

Summa Cans	Restek	101629	101803	2007	Volatiles Lab
Summa Cans	Restek	101630	101804	2007	Volatiles Lab
Summa Cans	Restek	101631	101805	2007	Volatiles Lab
Summa Cans	Restek	101632	101806	2007	Volatiles Lab
Summa Cans	Restek	101655	101807	2007	Volatiles Lab
Summa Cans	Restek	101656	101808	2007	Volatiles Lab
Summa Cans	Restek	101657	101809	2007	Volatiles Lab
Summa Cans	Restek	101658	101810	2007	Volatiles Lab
Summa Cans	Restek	101659	101811	2007	Volatiles Lab
Summa Cans	Restek	101660	101812	2007	Volatiles Lab
Summa Cans	Restek	101661	101813	2007	Volatiles Lab
Summa Cans	Restek	101662	101814	2007	Volatiles Lab
Summa Cans	Restek	101663	101815	2007	Volatiles Lab
Summa Cans	Restek	101664	101816	2007	Volatiles Lab
Summa Cans	Restek	101665	101817	2007	Volatiles Lab
Summa Cans	Restek	101666	101818	2007	Volatiles Lab
Summa Cans	Restek	1025	1068?7 changed to 109061		Volatiles Lab
Summa Cans	Restek	101767	109083	2010	Volatiles Lab
Summa Cans	Restek	101768	109084	2010	Volatiles Lab
Summa Cans	Restek	101769	109085	2010	Volatiles Lab
Summa Cans	Restek	101770	109086	2010	Volatiles Lab
Summa Cans	Restek	101771	109087	2010	Volatiles Lab
Summa Cans	Restek	101773	109088	2010	Volatiles Lab
Summa Cans	Restek	101775	109089	2010	Volatiles Lab
Summa Cans	Restek	101776	109090	2010	Volatiles Lab
Summa Cans	Restek	101772	109091	2010	Volatiles Lab
Summa Cans	Restek	101774	109092	2010	Volatiles Lab
Summa Cans	Restek		109180 replaces 10179X	Sticker replaced on 3_2012	Volatiles Lab
Summa Cans	Restek	12481	109213	2012	Volatiles Lab
Summa Cans	Restek	12482	109214	2012	Volatiles Lab
Summa Cans	Restek	12483	109215	2012	Volatiles Lab
Summa Cans	Restek	12484	109216	2012	Volatiles Lab
Summa Cans	Restek	12485	109217	2012	Volatiles Lab
Summa Cans	Restek	12486	109218	2012	Volatiles Lab
Summa Cans	Restek	12487	109219	2012	Volatiles Lab
Summa Cans	Restek	12488	109220	2012	Volatiles Lab

Summa Cans	Restek	12489	109221	2012	Volatiles Lab
Summa Cans	Restek	12490	109222	2012	Volatiles Lab
6 liter Summa Can	Restek	503	109223	2012	Volatiles Lab
6 liter Summa Can	Restek	504	109224	2012	Volatiles Lab
6 liter Summa Can	Restek	505	109225	2012	Volatiles Lab
6 liter Summa Can	Restek	506	109226	2012	Volatiles Lab
6 liter Summa Can	Restek	507	109227	2012	Volatiles Lab
6 liter Summa Can	Restek	508	109228	2012	Volatiles Lab
6 liter Summa Can	Restek	509	109229	2012	Volatiles Lab
6 liter Summa Can	Restek	510	109230	2012	Volatiles Lab
6 liter Summa Can	Restek	511	109231	2012	Volatiles Lab
6 liter Summa Can	Restek	512	109232	2012	Volatiles Lab
6 liter Summa Can	Restek	1062	109233	2012	Volatiles Lab
6 liter Summa Can	Restek	1063	109234	2012	Volatiles Lab
6 liter Summa Can	Restek	1064	109235	2012	Volatiles Lab
6 liter Summa Can	Restek	1065	109236	2012	Volatiles Lab
6 liter Summa Can	Restek	1066	109237	2012	Volatiles Lab
6 liter Summa Can	Restek	1067	109238	2012	Volatiles Lab
6 liter Summa Can	Restek	1068	109239	2012	Volatiles Lab
6 liter Summa Can	Restek	1069	109240	2012	Volatiles Lab
6 liter Summa Can	Restek	1070	109241	2012	Volatiles Lab
6 liter Summa Can	Restek	1071	109242	2012	Volatiles Lab
Summa Can	Restek		108689	2013	Volatiles Lab
Summa Can	Restek		108597	2013	Volatiles Lab
Summa Can	Restek		108589	2013	Volatiles Lab
Summa Can	Restek		104498	2013	Volatiles Lab
Summa Can	Restek		108677	2013	Volatiles Lab
Summa Can	Restek		108673	2013	Volatiles Lab
Summa Can	Restek		108798	2013	Volatiles Lab
Summa Can	Restek		108538	2013	Volatiles Lab
Summa Can	Restek		108717	2013	Volatiles Lab
Summa Can	Restek		108702	2013	Volatiles Lab
Summa Can	Restek		108491	2013	Volatiles Lab
Summa Can	Restek		108574	2013	Volatiles Lab
Summa Can	Restek		108572	2013	Volatiles Lab
Summa Can	Restek		108596	2013	Volatiles Lab
Summa Can	Restek		108584	2013	Volatiles Lab
Summa Can	Restek		108590	2013	Volatiles Lab
Summa Can	Restek		108585	2013	Volatiles Lab
Summa Can	Restek		108866	2013	Volatiles Lab

Summa Can	Restek		108853	2013	Volatiles Lab
Summa Can	Restek		108693	2013	Volatiles Lab
Summa Can	Restek		108611	2013	Volatiles Lab
Summa Can	Restek		108715	2013	Volatiles Lab
Summa Can	Restek		108_75 replaced with 109434	2013 label replaced	Volatiles Lab
Flow Controller (stainless)	Restek	5455	109203	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5456	109204	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5457	109205	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5458	109206	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5459	109207	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5460	109208	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5461	109209	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5462	109210	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5463	109211	2012	Volatiles Lab
Flow Controller (stainless)	Restek	5464	109212	2012	Volatiles Lab
Mini Canisters		204-223	109010-109029	2010	Volatiles Lab
AutoSampler	Varian	Archon	108484	1999	Volatiles Lab
Flow Controller (stainless)			109181 replaces 109039		Volatiles Lab
Freezer			101851	2009	Volatiles Lab
Regulators	Entech	4134-4143	109044-109053	2010	Volatiles Lab
Weight Ultra Class 10g	Troemner Weight 10g	1000068526	109337	2013	Volatiles Lab
Spectroscopy					
Balance, Micro-analytical	Mettler Toledo	XP26 (S/N1123040042)	108180	2009	Dust Room
Balance, Top Loading	Denver	610 G/0.01g	101834	2008	Inorganic Prep
Balance, Micro-analytical	Ohaus	AR1530	108155	2004	Inorganic Analysis
Balance, Micro-analytical	Mettler Toledo	AT201 (S/N 1117023479)	108464	1997	Inorganic Analysis
Balance, Micro-analytical	Sartorius	ED124S (S/N25950258)	109093	2011	Inorganic Analysis
Cyanide Midi-Vap Distiller	Kontes	-	108466	1998	Wet Chem Lab
Drying Oven	FisherBrand	Isotemp	108504	2000	Inorganic Prep
FT-IR Spectrometer	Perkin Elmer	Spectum RX1	108161-108162	2004	Inorganic Analysis
1 Hood WetChem			109121		Wet Chem Lab

Hotblock Digestor (100ml)	Environmental Express	25 Sample	101782	2004	Inorganic Prep
Hotblock Digestor (50ml)	Environmental Express	54 Sample	101681 & 101768	2002	Inorganic Prep
Hotblock Digestor (50ml)	Environmental Express	36 Sample	108471	2000	Inorganic Prep
Hot Plate	Barnstead/Themolyne		108160---101784		Inorganic Prep
ICAP, Trace- IRIS	Thermo Electron Corp.	IRIS Intrepid II XDL	108174 - 108175	2005	Inorganic Analysis
ICAP	Thermo Jarrell Ash	6000 Series Model 6500	101781	2007	Inorganic Analysis
ICAP	Thermo Jarrell Ash	6000 Series Model 6500	109063(iCAP), 109064(Cetac ASX520 AutoSampler, 109065(Dell Computer-23969928999Exp .Ser.Code)	2010	Inorganic Analysis
Mercury Analyzer- Cold Vapor AA	Cetac Technologies	Quicktrace M 7500 S/N 021001QTA/ autosampler 100152ASX	109042 (analyzer) & 109043 (computer)	2010	Inorganic Analysis
pH/Temp/Conductivity	SympHony VWR	Model: SB80PC/Ser. # DO4612	109041	2010	Wet Chem Lab
Conductivity Electrode	ThermoScientific	013016MD	109054	2010	Inorganic Prep
pH Temp Electrode	ThermoScientific	97014-788	109058	2010	Inorganic Prep
pH/Temp/ISE	FisherBrand	AB15	108191	2004	Inorganic Prep
Printer	Citizen	HSP 500	104472	1992	Instrument Lab
Spectrophotometer	Milton Roy	Spectronic 21D	104474	1992	Wet Chem Lab
Water Bath	VWR	1204	101502	1997	Inorganic Prep
Water Polisher	Barnstead	E-pure	108154	2003	Inorganic Prep
100g weight	Troemner		Serial # 24114	2008	Dust Room
2 Hoods			109117 (Spec Hood #1) & 104750 (Spec Hood #2)	1988	Inorganic Prep
Stirrer	Biomega Research Products, Inc.	Model H4000-S Ser# 20100113034	109055	2010	Inorganic Prep
Pippette 100-1000uL(.1-1mL)	Eppendorf-Research Plus Variable Vol.	320431A	109284	11-Jul-12	Inorganic Prep

Pippette 0.5-5 mL	Eppendorf-Research Plus Variable Vol.	I38644B	109282	11-Jul-12	Inorganic Prep
Pippette 0.5-5 mL	Eppendorf-Research Plus Variable Vol.	I38730B	109285	11-Jul-12	Inorganic Prep
Pippette 0.5-5 mL	Eppendorf-Research Plus Variable Vol.	I38584B		11-Jul-12	Inorganic Prep
Pippette 1-10mL	Eppendorf-Research Plus Variable Vol.	N26962B	109280	28-Nov-12	Inorganic Prep
Pippette 0.5-5 mL	Eppendorf-Research Plus Variable Vol.	J28951B	109279	28-Nov-12	Inorganic Prep
Pippette 1.0 mL	Eppendorf-Research Plus Variable Vol.	252831Z	109283	01-Jul-11	Inorganic Prep
Pippette 1-10mL	Eppendorf-Research Plus Variable Vol.	2655696	109305		Wet Chem Lab
Pippette 1-10 mL	Eppendorf-Research Plus Variable Vol.	3949129	109336		ICP Lab
NIST Traceable Chilled Mirror Hygrometer/Thermometer	VWR (Cat.#36934-164)	S/N- 101883438	109082	2010	Dust Room
Transmission Electron Microscopy					
Carbon Evaporator	Denton	DV-502A	101116	1988	TEM Prep Lab
EDXA	EDAX	Genesis	101016	2005	TEM Lab
Low Temperature Plasma Etcher	AAA Arts	PA 1977	101211/101112	1988	TEM Prep Lab
HON 4 drawer filing cabinet			101787	2007	TEM Lab
Stereoscope	Olympus	SZ40	101397	1991	TEM Lab
Ventilation Hood- Biosafety Cabinet	Forma Scientific	Model 1576 S/N-11673-12	109066	1988	TEM Lab
Professional Heat Gun	Ryobi	HG500 120V	109115	2011	TEM Water Lab
Filtration Aparatus- GAST Pump	GAST Mfg.	603227018	109071		TEM Water Lab
Sonicator (ultrasonic cleaner)	VWR Model 97043-972	S/N 1215A1399	109404	2013	TEM Water Lab next to Ext. Lab
TEM Microscope	FEI	Model Tecnai G2 Spirit Twin # 9432 050 18111 S/N 9920401/D1233	109109 (Microscope), 109110 (operating computer), 109111 (support	2011	TEM Lab

			computer) , 109112 (water chiller) & 109113 (air compressor)		
Polarlized Light Microscopy					
PLM	Olympus- PLM Scope	BX-53	109523	8/20/13	PLM Lab
PLM	Olympus-Stereo Scope	SZ-61	109524	8/20/13	PLM Lab
PLM	Olympus-Stereo Scope	SZ-61	109525	8/20/13	PLM Lab
PLM	Olympus	BH-2	101026	1988	PLM Lab
PLM Characterization	Olympus	BH-2-Ser.#239540	101396	1991	PCM Lab
Stereoscope	Olympus	SZ	101030	1988	PLM Lab
Hot plate/slide warmer	Barnstead International	HP 2305B	109068		PLM Lab
Muffle Furnace	FisherBrand	Isotemp	108503	2000	PLM Lab
Ultrasonic Bath- 1.9 Liter	VWR	Model 97043-960 S/N1011A0690	109095	2011	PLM Lab
Refractometer	FisherBrand		108489	1999	PLM Lab
Drying Oven- 120 Volt, 6.7 Amp	Thermo Scientific	PR 305225G Model 3511	101850	2009	Ext. Lab (for PLM)
Table Top Hood PLM	Kewaunee Sci. Equip. Corp.		101843	1988	PLM Lab
Table Top Hood PCM			101844	1989	PCM Lab
NIST Traceable Chilled Mirror Hygrometer/Thermometer	VWR (Cat.#36934-164)	S/N- 101883465	109081	2010	PLM Lab
2-Channel Thermometer Traceable	Control Company for Fisher Scientific	S/N130068832	109338	2/19/13	PLM Lab
Temperature Probe Coil	Control Company (VWR) Type K Beaded Probe High Temp.	VWR- Cat. #77776-728 SN-P12.1388K4EA	109356	2013	PLM Lab
Phase Contrast Microscopy					
PCM	Olympus	BH-2	101025	1988	PCM Lab
PCM	Olympus	CH-2	101332	1991	PCM Lab
PCM Ventilated Hood	Hepa-Pleat II (Miller Fabrications, Inc.)	S/N 2357628	109062	1988	PCM Lab
Radiation Safety					
Cutie Pie	Technical Associates	CP-6 Mark III	102911	1993	Rad. Safety

Portable Ratemeter-Scaler	Technical Associates	PRS-3	102884	1993	Rad. Safety
Portable Ratemeter-Scaler	Technical Associates	PRS-3	102883	1993	Rad. Safety
Alpha Scintillation Probe	Technical Associates	PSA-9	102886	1993	Rad. Safety
G-M Pancake Probe	Technical Associates	P-11A	102885	1993	Rad. Safety
Dual Channel Scaler	Ludlum Meas. Inc.	2929	102776	1993	Rad. Safety
Pancake Probe	NDS Products	ND-CPM	108506	1999	Rad. Safety
Portable Ratemeter-Scaler	NDS Products	ND-CPM	108505	1999	Rad. Safety
IH Air Pumps					
Sampling Pump (SN#675238)	SKC	AirLite	101682	2003	Media Cabinets
Sampling Pump (SN#675241)	SKC	AirLite	101683	2003	Media Cabinets
Sampling Pump (SN#675304)	SKC	AirLite	101684	2003	Media Cabinets
Sampling Pump (SN#675209)	SKC	AirLite	101685 label replaced w/109405	2003	Media Cabinets
Sampling Pump (SN#675201)	SKC	AirLite	101686	2003	Media Cabinets
Sampling Pump (SN#675368)	SKC	AirLite	101687	2003	Media Cabinets
Sampling Pump (SN#675341)	SKC	AirLite	101688	2003	Media Cabinets
Sampling Pump (SN#675360)	SKC	AirLite	101689	2003	Media Cabinets
Sampling Pump (SN#675834)	SKC	AirLite	101690	2004	Media Cabinets
Sampling Pump (SN#675780)	SKC	AirLite	101691	2004	Media Cabinets
Sampling Pump (SN#675757)	SKC	AirLite	101692	2004	Media Cabinets
Sampling Pump (SN#675792)	SKC	AirLite	101693	2004	Media Cabinets
Sampling Pump (SN#675767)	SKC	AirLite	101694	2004	Media Cabinets
Sampling Pump (SN#745425)	SKC	AirLite	101695	2005	Media Cabinets
Sampling Pump (SN#745443)	SKC	AirLite	101696	2005	Media Cabinets
Sampling Pump (SN#745458)	SKC	AirLite	100697	2005	Media Cabinets
Sampling Pump (SN#745984)	SKC	AirLite	100698	2005	Media Cabinets
Sampling Pump (SN#745949)	SKC	AirLite	100699	2005	Media Cabinets
Sampling Pump (SN#745332)	SKC	AirLite	100700	2005	Media Cabinets
Sampling Pump (SN#745344)	SKC	AirLite	108192	2005	Media Cabinets

Sampling Pump (SN#745200)	SKC	AirLite	108193	2005	Media Cabinets
Sampling Pump (SN#745293)	SKC	AirLite	108194 label replaced w/109406 replaced w/109410	2005	Media Cabinets
Sampling Pump (SN#745327)	SKC	AirLite	108195	2005	Media Cabinets
Sampling Pump (SN#814804)	SKC	AirLite	101779	2007	Media Cabinets
Sampling Pump (SN#814824)	SKC	AirLite	101780	2007	Media Cabinets
Sampling Pump (SN#814851)	SKC	AirLite	101829	2007	Media Cabinets
Sampling Pump (SN#814828)	SKC	AirLite	101830	2007	Media Cabinets
Sampling Pump (SN#814591)	SKC	AirLite	101831	2007	Media Cabinets
Sampling Pump (SN#814648)	SKC	AirLite	109004	2009	Media Cabinets
Sampling Pump (SN#814626)	SKC	AirLite	109005	2009	Media Cabinets
Sampling Pump (SN#882212)	SKC	AirLite	109006	2009	Media Cabinets
Sampling Pump (SN#882768)	SKC	AirLite	109007	2009	Media Cabinets
Sampling Pump (SN#814972)	SKC	AirLite	109008	2009	Media Cabinets
Sampling Pump (SN#814434)	SKC	AirLite	109072	2010	Media Cabinets
Sampling Pump (SN#814987)	SKC	AirLite	109073	2010	Media Cabinets
Sampling Pump (SN#814475)	SKC	AirLite	109074	2010	Media Cabinets
Sampling Pump (SN#814413)	SKC	AirLite	109075	2010	Media Cabinets
Sampling Pump (SN#814929)	SKC	AirLite	109076	2010	Media Cabinets
Sampling Pump (SN#814416)	SKC	AirLite	109077	2010	Media Cabinets
Sampling Pump (SN#814922)	SKC	AirLite	109078	2010	Media Cabinets
Sampling Pump (SN#814944)	SKC	AirLite	109079	2010	Media Cabinets
Sampling Pump (SN#814958)	SKC	AirLite	109097	2011	Media Cabinets
Sampling Pump (SN#814421)	SKC	AirLite	109098	2011	Media Cabinets
Sampling Pump (SN#A059423)	SKC	AirLite	109099	2011	Media Cabinets
Sampling Pump (SN#A059407)	SKC	AirLite	109100	2011	Media Cabinets
Sampling Pump (SN#A059480)	SKC	AirLite	109101	2011	Media Cabinets

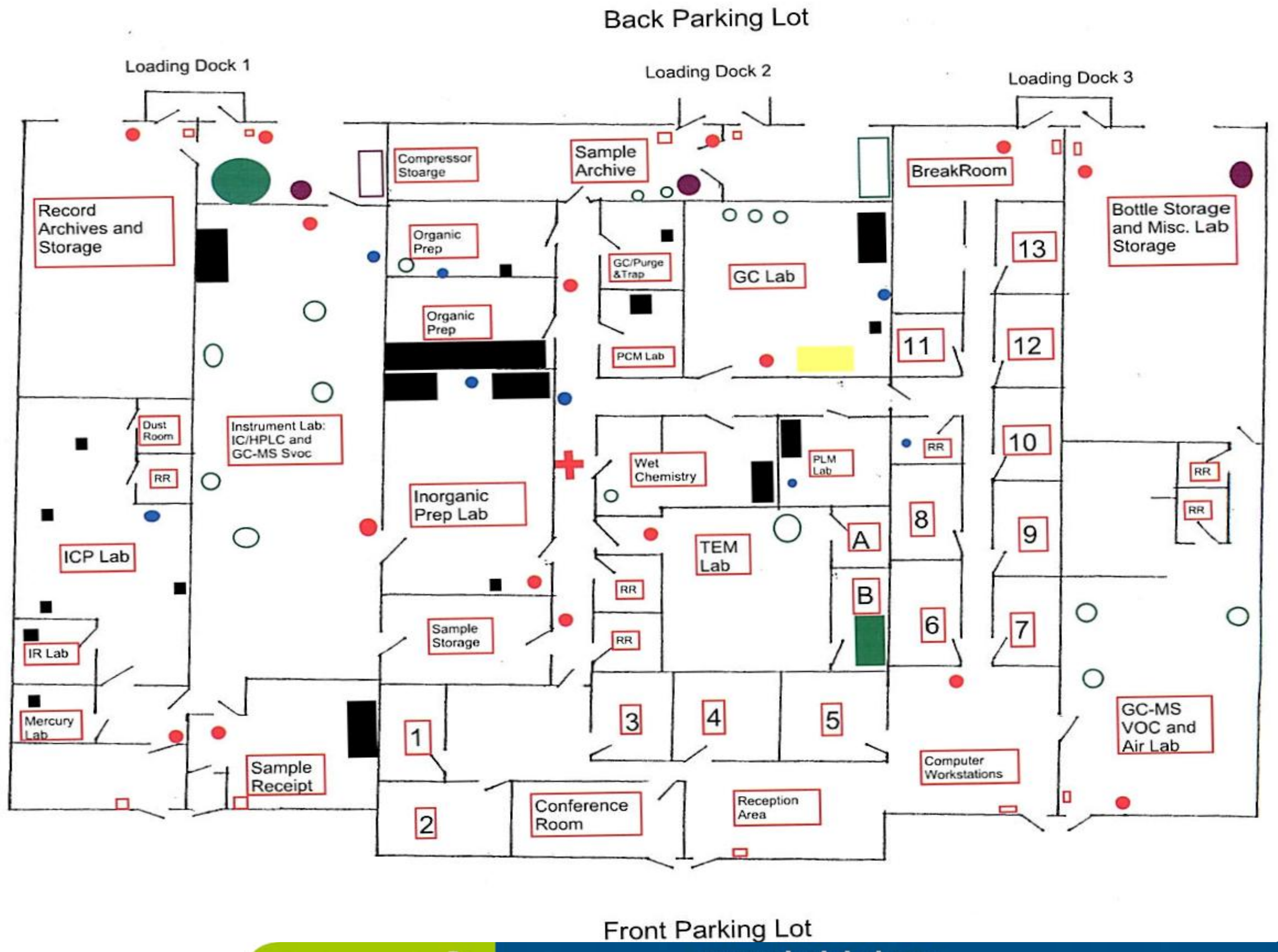
Sampling Pump (SN#817309)	SKC	AirLite	109102	2011	Media Cabinets
Sampling Pump (SN#A059422)	SKC	AirLite	109103	2011	Media Cabinets
Pelican Hard Case for SKC Pumps	SKC	AirLite	109104	2011	Media Cabinets
Pelican Hard Case for SKC Pumps	SKC	AirLite	109009	2009	Media Cabinets
Pelican Hard Case for SKC Pumps	SKC	AirLite	109376-78	2013	Media Cabinets
Lung Box- Vac-U-Chamber	SKC-West, Inc.		109069	2010	Media Cabinets
Sampling Pump (SN#A059832)	SKC	AirLite	109371	2013	Media Cabinets
Sampling Pump (SN#A059804)	SKC	AirLite	109370	2013	Media Cabinets
Sampling Pump (SN#A059881)	SKC	AirLite	109369	2013	Media Cabinets
Sampling Pump (SN#A059034)	SKC	AirLite	109368	2013	Media Cabinets
Sampling Pump (SN#A059849)	SKC	AirLite	109367	2013	Media Cabinets
Sampling Pump (SN#A059721)	SKC	AirLite	109366	2013	Media Cabinets
Sampling Pump (SN#A059830)	SKC	AirLite	109365	2013	Media Cabinets
Sampling Pump (SN#A059861)	SKC	AirLite	109364	2013	Media Cabinets
Sampling Pump (SN#A059054)	SKC	AirLite	109363	2013	Media Cabinets
Sampling Pump (SN#A059863)	SKC	AirLite	109362	2013	Media Cabinets
Sampling Pump (SN#A059101)	SKC	AirLite	109361	2013	Media Cabinets
Sampling Pump (SN#A059063)	SKC	AirLite	109360	2013	Media Cabinets
Sampling Pump (SN#A059181)	SKC	AirLite	109359	2013	Media Cabinets
Sampling Pump (SN#A059767)	SKC	AirLite	109358	2013	Media Cabinets
Sampling Pump (SN#A059046)	SKC	AirLite	109357	2013	Media Cabinets
Sample Receipt					
1 Hood Sample Receipt			109116		Sample Rec.
Samsung Digital Camera	Samsung	Model SL50 S/N152UC90280 1223	109080	2010	Sample Rec.
Blue Coleman Safety Stacker			109276-277	2012	Sample Rec.
IR Gun Cert. # 4375-4839525	VWR IR Gun	77776-724/ Ser # 130006199	109317	1/31/13	Sample Rec.

IR Gun	Control Company/VWR	122434559	109266	2012	Sample Rec.
Community Instruments					
Sonicator	Branson	8510	101832		Back Loading Dock
Cordless Drill- 7.2 Volt	Black and Decker		109094	2011	Sample Rec.
Paper Trimmer	Swingline		109105	2011	Lobby
Refrigerator # B	Imperial Heavy Duty Commercial		109407	2013	Sample Storage
Traceable Big Digit See thru Thermometer	Control Company- Cat. # 36934-158	Model: 36934-158 S/N: 130352673	109504	2013	Tumbler Ext. Lab
QA Office					
Conductivity Probe			109054	2010	Spec Prep
HON 4 drawer filing cabinet			101785	2007	QA Office
HON 4 drawer filing cabinet			101786		QA Office
Temperature Probe	Control Company	S/N: 90888238	101854	2009	QA Office
500 g Weight					
Safety Equipment					
Spectroscopy Eye Wash (sink)			109166		
Safety Shower (main hallway)			109165		
GC Eyewash (sink)			109164		
Extraction Eyewash (sink)			109163		
IC/LC Eyewash (sink)			109162		
ICP Safety Shower (ICP lab)			109161		

Appendix 5.0: ALS LEGEND AND FLOORPLAN

Appendix 5: ALS Legend and Floorplan

✚	First Aid/AED
🔴	Fire Extinguisher
🟣	Hazardous Waste Collection
▭	Acidified Sample Storage
🔵	Safety Shower/ Eye Wash Station
🟢	Argon Dewer
▭	Fire Alarm Pull
⬛	Chemical Fume Hood or Snorkel
🟩	Biosafety Cabinet
🟨	Flammable Storage Cabinet
□	Compressed Gas Cylinder Storage
○	Compressed Gas Cylinder
1-13	Offices
A	TEM Utility Room
B	TEM Filter Prep Lab


Back Parking Lot
Loading Dock 1
Loading Dock 2
Loading Dock 3
Record Archives and Storage
Compressor Stoarge
Sample Archive
BreakRoom
Bottle Storage and Misc. Lab Storage
Organic Prep
Organic Prep
GC/Purge &Trap
GC Lab
PCM Lab
13
12
11
10
Dust Room
RR
Instrument Lab: IC/HPLC and GC-MS Svoc
Inorganic Prep Lab
Wet Chemistry
PLM Lab
RR
RR
RR
ICP Lab
TEM Lab
A
B
8
9
6
7
RR
RR
Sample Storage
IR Lab
Mercury Lab
1
3
4
5
GC-MS VOC and Air Lab
Sample Receipt
Computer Workstations
2
Conference Room
Reception Area
Front Parking Lot

Appendix 6.0: LABORATORY STANDARD OPERATING PROCEDURES

SOP LIST SOP #	Title
DCLC-SOP-009	Data Record Keeping
DCLC-SOP-020	Calculation of Method Detection Limits
DCLC-SOP-044	Flash Point of Liquids
ENV-001	Inorganic Glassware Cleaning
ENV-002	Organic Glassware Cleaning
ENV-003	Walkley-Black Procedure for the Determination of TOC
ENV-004	Preparation and Analysis of Soil Samples for Asbestos
ENV-005	Preparation and TEM Analysis of Water Samples for Asbestos
ENV-018	Methane Analysis by GC/MS
ENV-160.1	Filterable Residue by EPA 160.1
ENV-160.2	Non-Filterable Residue by EPA 160.2
ENV-160.3	Total Residue by EPA 160.3
ENV-300.0	300.0-Anions
ENV-305.1	Acidity by Titration Using EPA Method 305.1
ENV-310.1	Alkalinity by Titration Using EPA Method 310.1
ENV-330.2	Total Residual Chlorine
ENV-335.2 (CLP_M)	Total Cyanide in Water and Soil by Colorimitry
ENV-376.1	Sulfide by Titration Using EPA Method 376.1
ENV-413.1	Total Recoverable Oil and Grease by Separatory Funnel Extraction
ENV-417B	Ammonia as Nitrogen
ENV-418.1	Determination of Total Recoverable Petroleum Hyderocarbons by Infrared Spectrophotometery (418.1-TPH)
ENV-1110	Corrosivity toward Steel in Nonaqueous Liquids
ENV-1311	TCLP
ENV-2974	The Determination of Moisture, Ash, and Organic Matter of Soils and Peat
ENV-3005A	Hot Plate Acid Digestion of Waters
ENV-3010A	Hot Plate Acid Digestion of Liquids and Extracts
ENV-3050B	Hot Plate Acid Digestion of Solids
ENV-3510C	Separatory Funnel Liquid-Liquid Extraction
ENV-3540C	Soxhlet Extraction
ENV-3550B	Sonication Extraction
ENV-3580A	Waste Dilution
ENV-3620B	Florisil Column Cleanup
ENV-3660B	Sulfur Cleanup

ENV-3665A	Acid Cleanup by EPA 3665A
ENV-6010B	6010-Metals by ICP
ENV-7.3.3.2	Hydrogen Cyanide Released from Wastes
ENV-7.3.4.2	Hydrogen Sulfide Released from Wastes
ENV-7196A	Hexavalent Chromium-Colorimetric
ENV-7470A	Mercury in Liquid Waste
ENV-7471A	Mercury in Solids
ENV-8015A-GRO	8015A Modified-Gasoline Range Organics
ENV-8015B-DRO	8015B- Diesel Range Organics
ENV-8020A	Volatile Aromatic Compounds by EPA 8020A
ENV-8021	8021 BTEX / MTBE
ENV-8081A	8081A-Pesticides
ENV-8082	8082 PCBs
ENV-8082	8082 PCBs- NON VAP (oils added)
ENV-8100	Polynuclear Aromatic Hydrocarbons
ENV-8260A	Volatile Organic Compounds by GC/MS
ENV-8260B	Volatile Organic Compounds by GC/MS
ENV-8270C	Semi-Volatile Organic Compounds by GC/MS
ENV-8310	PAH by HPLC-UV Fluorescence
ENV-9040B	Determination of pH of Aqueous Wastes by Electrometic Method
ENV-9045C	Determination of pH of Soil, Sludges, & Wastes by Electrometric Method
ENV-9095	Paint Filter Liquids Test
GEN-001	Preparation and Labeling of Solutions
GEN-003	Volumetric Glassware
GEN-004	Equipment Calibration and Maintenance
GEN-005	Data Reduction and Validation
GEN-006	Sample Preservation and Holding Times
GEN-008	Preventive Maintenance for Analytical Instrumentation
GEN-009	Reporting of Data
GEN-010	Client Services
GEN-011	Subcontracting and Suppliers
GEN-012	Client Confidentiality
GEN-013	Estimation of Measurement Uncertainty
GEN-014	Non-standard or Modified Method Validation
GEN-016	Procurement Control
GEN-017	Accreditation/Certification/Registration Logos and Advertising

GEN-018	Manual Integration on Chromatography Data Systems
GEN-019	Subsampling for Soil and Sediments
GEN-020	Evaluation of Lead Surface Contamination
GEN-021	Network Systems and Security
IH-001	Determination of Analytes By NIOSH and OSHA Methods Using Gas Chromatography
IH-002	Determination of Suspended Particulates in the Atmosphere Using Various Media
IH-003	Determination of Suspended Particulates Not Otherwise Regulated (Total and Respirable)
IH-004	Determination of Analytes By NIOSH and OSHA Methods Using Liquid Chromatography
IH-005	Benzene-Soluble Fraction and Total Particulate (Asphalt Fume)
IH-006	Methods IO-3.1 & IO-3.4 mod. Metals Pep and Analysis for Susp. Part.
IH-6009	Mercury in Industrial Hygiene Samples by Manual CVAAS
IH-7199	Hexavalent Chromium by Ion Chromatography for Water and Soil Extracts
IH-7300mod.	Elements by ICP
QA-001	Internal Audits
QA-004	Archives
QA-005	Charting and Control Limits
QA-006	Employee Training and Documentation
QA-007	Chain of Custody and Laboratory Tracking
QA-009	Quality Document Preparation and Control
QA-010	Management Review
QA-011	Supporting Equipment Calibrations and Verifications
QA-012	QA Operations
QA-013	Demonstration of Competency for Industrial Hygiene
QA-NC/CAR	Nonconformance/Corrective Action
SC-001	Sample Receipt and Logging
SC-002	Sample Scheduling
SC-003	Processed Sample Storage and Disposal
SC-004	Sample Storage and Security
SC-005	VAP Sample Recognition
SC-005FS	Receiving, Handling, Storing, and Disposing of Foreign Soils
RAD-002	TEM Analyst Radiation Exposure Monitoring

RAD-003	Receiving Radioactive and Beryllium Containing Samples
RAD-004	Handling and Storage of Radioactive or Beryllium Containing Materials
RAD-005	Disposal of Radioactive or Beryllium Containing Samples and Wastes
TO-4A	PCBs in Air
TO13A	The Determination of Semivolatile Compounds including PAHs in Ambient Air using GC/MS
TO14-analysis	Analysis of Ambient Air by TO-14
TO14A/15-cleaning	Polished Stainless Steel Canister and Sampling System Cleaning/Certification
TO15	Analysis of Volatile Organic Compounds in Ambient Air Using Passive Canisters by EPA TO-15 for VAP
PCM-002	PCM Sample Prep and Analysis
PCM-IDOC-006	PCM IDOC
PLM-Calibration-001	PLM Calibration
PLM-Analysis-002	PLM Analysis for Bulk Asbestos
PLM-QC-004	PLM Quality Control
PLM-Point Count-006	PLM Point Counting
PLM-VAT-007	PLM VAT Preparation for Analysis
PLM-RCF-008	Refractory Ceramic Fibers
PLM-RI-009	Refractive Index Oil Calibration
TEM-Samprep-001	AHERA Direct Prep of MCE Filters
TEM-Samprep-002	Direct Prep of Polycarbonate Filters
TEM-Samprep-003	Sample Prep of Bulk Materials for TEM
TEM-Samprep-004	Prep of Waste Water Samples for TEM
TEM-Samprep-005	Prep of Tissue Sample for TEM Analysis
TEM-Cal-Ash-006	Calibration of Plasma Asher
TEM-Cal-Mag-007	TEM Magnification Calibration
TEM-Cal-EDS-008	Calibration: EDXA Peak Position
TEM-Cal-Diff-011	Camera Constant Calibration
TEM-Op-Ash-012	Operation of Plasma Asher
TEM-Op-Cvap-013	Operation of Carbon Evaporator
TEM-Micro-Op-014	Start-up and Shut-down of TEM
TEM-Micro-Op-015	TEM Alignment
TEM-Micro-Op-018	TEM Diffraction Mode: Obtaining SAED Patterns
TEM-Micro-Op-019	Obtaining Energy Dispersive X-Ray Spectra
TEM-Micro-Op-020	On-screen Measurement of Bright Field Image

TEM-Micro-Op-021	AHERA Analysis Method of Air Samples
TEM-Op-Diff-022	On-screen Diffraction Measurements-AHERA (SAED Patterns)
TEM-QC-VAA-023	QC: Verified Asbestos Analysis with Sketches
TEM-QC-Prof-024	QC: Proficiency Tests, Sample Handling & Analysis
TEM-Maint-CVap-027	Carbon Evaporator Maintenance
TEM-Maint-TEM-028	Electron Microscope Maintenance
TEM-QC-Count-029	QC: Duplicates and Replicates
TEM-QC-Verify-031	QC: Report Review
TEM-QC-Contam-032	QC: Check for Laboratory Contamination
TEM-QC-Blank-034	QC: Laboratory Blanks, Prep and Analysis
TEM-QC-Archive-035	QC: Sample Archive
TEM-QC-Photoarch-036	QC: Electron Micrograph Archive
TEM-GLP-Call-040	Client Notification
TEM-PrepEval-042	Pre-analysis Grid Prep Evaluation
TEM-Micro-Grid-043	Load TEM Grid in Sample Holder
TEM-Op-PA-044	Pre-analysis Check of Electron Microscope
TEM-Op-D.I.-048	Indexing Diffraction Patterns
TEM-Cal-Grid-049	Measuring & Calculating Grid Opening Area
TEM-Cal-Dose-050	Electron Beam Dose Calibration
TEM-Cal-Spot-051	Electron Beam Spot Size Calibration
TEM-Cal-Meas-053	Bright Field On-Screen Measurement Calibration
TEM-Cal-Diffmeas-054	Diffraction Mode On-Screen Measurement Calibration
TEM-Samprep-055	Sample Prep TEM- Gravimetric
TEM-Samprep-056	Drinking Water Sample Prep, Chatfield Method
TEM-SOP-057	Drinking Water Analysis, Chatfield Method
TEM-SOP-NIOSH-058	NIOSH 7402 Analysis
TEM-PCM-PLM-Def-059	Definitions for Asbestos Analysis by TEM, PCM, PLM

This table is subject to update and may be revised without notice.

Appendix 7.0: ACCREDITATIONS CERTIFICATIONS, AND PROFICIENCY TESTING

Appendix 7.0: Accreditations, Certifications, and Proficiency Testing

ALS CERTIFICATION PROGRAMS

American Industrial Hygiene Association (AIHA): Lab Code: 100921, Inorganic Analyses by Ion Chromatography, Inductively Coupled Plasma Spectroscopy, Atomic Absorption-Cold Vapor Spectroscopy and Gravimetric Techniques, Organic Analyses by HPLC and Gas Chromatography, Asbestos Air Analyses by Optical Microscopy (PCM) and Electron Microscopy (TEM) and Asbestos Bulk Analyses by Optical Analyses (PLM).

AIHA Environmental Lead Laboratory Accreditation Program (ELLAP): Lab Code: 100921, Lead Paint, Wipes, Air and Soils/Bulks.

National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NIST NVLAP): Lab Code: 101917-0, Bulk Asbestos by PLM and AHERA (air) by TEM.

Ohio EPA Voluntary Action Plan (VAP): Lab Code: CL0022, EPA Methods— 8260A & 8260B (soil & water), TO-15 (air), 8270C (soil, water & air), 8081A, 8082, 6010B, 7470A & 7471A, 8015B (diesel), 8015A-modified (gasoline), 335.2 (CLP-M), EPA 300.0, Asbestos (soil and water).**

Ohio Department of Health Radioactive Materials License

Ohio Department of Health: Lead Poisoning Prevention Program: Lab Code: 10001, Lead Paint, Wipes, Air and Soils/Bulks

National Environmental Laboratory Accreditation Conference (NELAC) – State of Louisiana Environmental Laboratory Accreditation Program (LELAP): Lab ID (Cert. No.): 05027 AI No.: 175036 Methods (Soil and Water)- 335.2, 218.6, 6010B, 7199, 7470A, 7471A, 8015A&B, 8020A, 8081A, 8082, 8260A&B, 8270C Air- TO-4,TO-15, TO-13A, and Asbestos (bulk by EPA600/R-93/116).

**** See the certificate and scope for specific analytes**

Appendix 7.0: Accreditations, Certifications, and Proficiency Testing *(Continued)*

ALS CERTIFICATION PROGRAMS

***New York Environmental Laboratory Accreditation Program (ELAP) through the New York Department of Health: Lab Code: 11371*, PCM (air), PLM (Bulk (NOB), friable), and TEM (water, air, and NOB).**

INDIVIDUAL STATES:

Georgia: asbestos in drinking water

Idaho: asbestos in drinking water

Indiana: asbestos in drinking water

Kansas: asbestos in drinking water

Louisiana: asbestos in drinking water

Michigan: asbestos in drinking water

Montana: asbestos in drinking water

Nebraska: asbestos in drinking water

Nevada: asbestos in drinking water

New Mexico: asbestos in drinking water

New York: asbestos in drinking water (NELAC certified)

North Carolina: asbestos in drinking water

Ohio: asbestos in drinking water

Pennsylvania: asbestos in drinking water

South Carolina: asbestos in drinking water

South Dakota: asbestos in drinking water

Tennessee: asbestos in drinking water

Utah: asbestos in drinking water

Washington State: asbestos in drinking water

Wyoming (EPA Region 8): asbestos in drinking water

Appendix 7.0: Accreditations, Certifications, and Proficiency Testing *(Continued)*

ALS PROFICIENCY TESTING PROGRAMS

ALS participates in the following proficiency testing programs:

- AIHA Proficiency Analytical Testing program
- AIHA (ELPAT) Environmental Lead program
- NIST NVLAP proficiency test rounds by RTI
- New York Environmental Laboratory Accreditation Program (NELAC) Proficiency Test Program
- RTC Solid Matrix and Water Pollution Proficiency Testing Program

Appendix 7.0: Accreditations, Certifications, and Proficiency Testing *(Continued)*

PROFICIENCY TESTING PLAN TO SATISFY REQUIREMENTS FOR ALL ACCREDITATIONS/ CERTIFICATIONS /REGISTRATIONS FROM 2010-2015

Proficiency Tests Required:

Accreditation/ Certification/Registration Program	Field of Testing	Frequency	Provider	Participation Months
AIHA:	HPLC	4/year	In-House	Jan., Apr., Jul., Oct
	Lead in Air	4/year	AIHA	Jan., Apr., Jul., Oct.
	Gas Chromatography	4/year	AIHA	Jan., Apr., Jul., Oct.
	Metals	4/year	AIHA	Jan., Apr., Jul., Oct.
	Mercury CV	2/year	In-House	Spring and Fall
	Ion Chromatography	2/year	In-House	Spring and Fall
	Gravimetric	2/year	In-House	Spring and Fall
	Diffusive Samplers	2/year	AIHA	Jan., Jul.
	Airborne Fibers-PCM	4/year	AIHA	Jan., Apr., Jul., Oct.
AIHA ELLAP:	Lead in Paint	4/year	AIHA	Feb., May, Aug., Nov.
	Lead in Soil	4/year	AIHA	
	Lead Wipes	4/year	AIHA	
NVLAP: Asbestos	PLM	2/year	RTI	Spring and Fall
	TEM Air	2/year	RTI	
NY ELAP: Asbestos	TEM- Water, Air, Bulk (NOB)	2/year	NY ELAP	Sept., Feb.
	PCM-Air	2/year	NY ELAP	May, Nov.
	PLM- Friable Bulk	2/year	NY ELAP	May, Nov.
NELAC: (Soils & Nonpotable Water)	218.6 (water)	2/year	RTC	April/Oct.-Soils Mar./Sept.-Water
	335.2 (CLP-M)			

NELAC: (Soils & Nonpotable Water) Continued	6010B 7199 (soil) 7470A 7471A 8015A-mod. (GRO) 8015B (DRO) 8020A	2/year	RTC	April/Oct.-Soils Mar./Sept.-Water
	8081A 8082 8260A/B			
	8270C			

Interlaboratory Exchange	**Field of Testing**	**Frequency**	**Provider**	**Participation Months**
Round Robin Program	PLM, PCM, TEM	2/year	ALS-(PCM, PLM) ALS, PSI, MA, AES- (TEM)	Spring and Fall
Round Robin Program	Volatiles by TO-15	2/year	ALS Salt Lake City	Spring and Fall

For Industrial Hygiene external proficiency testing, ALS uses AIHA and AIHA ELLAP. Asbestos external proficiency tests are provided by NY ELAP, NVLAP, and AIHA.

Providers for wastewater and solids are subject to change based on cost, availability, accreditation/certification/registration status changes, and/or provider performance. ALS currently uses RTC (RT Corp.) as the external proficiency test provider for environmental testing. RTC forwards these performance summaries to ALS as well as to ALS's certifying body (NELAC). The OH VAP program no longer requires proficiency tests.

The QA Manager posts the performance studies in the laboratory and archives these studies. If ALS has unacceptable analysis results, the Section Manager for that area of testing will investigate the nonconformance and will either rerun the proficiency test sample if possible or, if deemed necessary, will order a quality control sample from the PT provider if available. When the root cause of the nonconformance is determined, the QA Manager will forward the corrective action records to the appropriate certifying agencies.

Appendix 8.0: ENVIRONMENTAL SAMPLE PRESERVATION AND HOLDING TIMES

APPENDIX 8.0: Environmental Sample Preservation and Holding Times

SOLID/WASTE SAMPLES

Parameter	Reference Method	Container	Preservation and Storage	Holding Time Extract[1]	 Analyze[2]
Diesel Range- C_{10} to C_{20} middle distillates and C_{20} to C_{34} heavy distillates	EPA 8015B	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	40 days
Gasoline Range- C_6 to C_{12} light distillates	EPA 8015A	(1) 2 oz. glass jar	Refrigerate at 4°C	NA	14 days
Volatile Organics	EPA 8260A	(1) 2 oz. glass jars	Refrigerate at 4°C	NA	14 days
Volatile Organics	EPA 8260B	(3) Preweighed 40mL vials or (3) Encore® samplers & (1) 2 oz. glass jar	Preweighed in laboratory with Sodium Bisulfite Refrigerate at 4°C	NA	14 days
Semivolatile Extractable Organics	EPA 8270C	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	40 days
Aromatic Volatile Organics	EPA 8020A/ 8021	(1) 2 oz. glass jars	Refrigerate at 4°C	NA	14 days
Organochlorine Pesticides	EPA 8081A	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	40 days
PCBs	EPA 8082	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	40 days
Polynuclear Aromatic Hydrocarbons	EPA 8270C	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	40 days
Metals	EPA 6010B	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	6 months
Mercury	EPA 7471A	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	28 days
Oil and Grease	EPA 9070/9071	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	28 days
% Solids	EPA 160.1	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	7 days
pH	EPA 9045	(1) 2 oz. glass jar	Refrigerate at 4°C	NA	Analyze immediately
Ignitability	Pensky Martens Closed Cup	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	ASAP**
* Reactive Cyanide	EPA 7.3 & EPA 9012	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	ASAP**
* Reactive Sulfide	EPA 7.3 & EPA 9030	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	ASAP**
Anions	EPA 300.0	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	Nitrate/Nitrite – 48 hours, remaining anions - 28 days
Total Organic Carbon	Walkley-Black	(1) 4 oz. glass jar	Refrigerate at 4°C	NA	ASAP**
Asbestos (PLM)	EPA 600/R-93/116	(1) 4 oz. glass jar or suitable plastic bag	NA	NA	NA
Aldehydes	EPA 8315A	(1) 4 oz. glass jar	Refrigerate at 4°C	14 days	72 hours **

(1) From sample collection to extraction/distillation/digestion.
(2) From digestion/extraction to analysis.
(3) Can be analyzed from same bottle.
** These samples must be overnight shipped to the laboratory immediately following collection.
SM = Standard Methods (APHA) NA = Not applicable

APPENDIX 8.0: Environmental Sample Preservation and Holding Times *(Continued)*

WATER SAMPLES

Parameter	**Reference Method**	**Container**	**Preservation and Storage**	**Holding Time** Extract[1]	Analyze[2]
Diesel Range- C_{10} to C_{20} middle distillates and C_{20} to C_{34} heavy distillates	EPA 8015B	(1) 1 L glass bottle	Refrigerate at 4°C	7 days	40 days
Gasoline Range- C_6 to C_{12} light distillates	EPA 8015A	(2) 40 mL VOA vials	Refrigerate at 4°C; add 0.5 mL 1:1 HCl	NA	14 days
Volatile Organics	EPA 8260A, EPA 8260B, EPA 624	(2) 40 mL VOA vials	Refrigerate at 4°C; add 0.5 mL 1:1 HCl	NA	14 days
Semivolatile Extractable Organics	EPA 8270C EPA 625	(1) 1 L glass bottles; TFE-lined cap	Refrigerate at 4°C	7 days	40 days
Aromatic Volatile Organics	EPA 8021, EPA 8020A, EPA 602	(2) 40 mL VOA vials	Refrigerate at 4°C; add 0.5 mL 1:1 HCl	NA	14 days
Organochlorine Pesticides	EPA 8081A	(1) 1 L amber glass bottle; TFE-lined cap	Refrigerate at 4°C	7 days	40 days
PCBs	EPA 8082	(1) 1 L amber glass bottle; TFE-lined cap	Refrigerate at 4°C	7 days	40 days
Polynuclear Aromatic Hydrocarbons	EPA 8270C, EPA 8310	(1) 1 L glass bottle; TFE-lined cap	Refrigerate at 4°C	7 days	40 days
Metals	EPA 6010B, EPA 200.7	(1) 500 mL plastic bottle	Refrigerate at 4°C; add 1 mL conc. HNO_3	NA	6 months
Mercury	EPA 7470A*	(1) 500 mL plastic bottle	Refrigerate at 4°C; add 1 mL conc. HNO_3	NA	28 days
Chromium (VI)	EPA 7196A SM 312B	(1) 125 mL plastic bottle	Refrigerate at 4°C	NA	24 hours**
Sulfide	EPA 376.1	1000 mL	40 drops zinc acetate 100 drops NaOH	NA	7 days
BOD	EPA 5210B	500 mL	NA	NA	NA
MBAS	EPA 425.1	500 mL	NA	NA	48 hours

(1) From sample collection to extraction/distillation/digestion.
(2) From digestion/extraction to analysis.
(3) Can be analyzed from same bottle.
** These samples must be overnight shipped to the laboratory immediately following collection.
SM = Standard Methods (APHA)
NA = Not applicable

APPENDIX 8.0: Environmental Sample Preservation and Holding Times *(Continued)*

WATER SAMPLES

Parameter	**Reference Method**	**Container**	**Preservation and Storage**	**Holding Time** Extract[1]	 Analyze[2]
Total Cyanide	EPA 9012 EPA 335.2(CLP-M)	(1) 1 L plastic bottle	Refrigerate at 4°C; add 5 pellets NaOH	NA	14 days
Anions: Bromide, Chloride, Fluoride, Nitrate, Nitrite, Sulfate	EPA 300.0	(1) 500 mL plastic bottle	Refrigerate at 4°C	NA	Nitrate/Nitrite – 48 hours, remaining anions - 28 days
Total Phenolics	EPA 9066 EPA 420.2	(1) 1 L amber glass	Refrigerate at 4°C; add 2 mL conc. H_2SO_4	NA	28 days
Total Organic Carbon	EPA 415.1 EPA 9060	(1) 250 mL amber glass bottle	Refrigerate at 4°C; add 2 mL conc. H_2SO_4	NA	28 days
pH	EPA 9040B EPA 150.1	(1) 500 mL[3] plastic bottle	Refrigerate at 4°C	NA	Analyze immediately
Conductance	EPA 9050 EPA 120.1	(1) 500 mL[3] plastic bottle	Refrigerate at 4°C	NA	28 days
Chemical Oygen Demand	EPA 410.4	(1) 125 mL[3] plastic bottle	Refrigerate at 4°C; add 2 mL conc. H_2SO_4	NA	28 days
Oil & Grease	EPA 413.1 EPA 413.2	(1) 1 L glass bottle	Refrigerate at 4°C; add 2 mL conc. HCl	NA	28 days
Total Dissolved Solids	EPA 160.1	(1) 500 mL[3] plastic bottle	Refrigerate at 4°C	NA	7 days
Total Suspended Solids	EPA 160.2	(1) 500 mL[3] plastic bottle	Refrigerate at 4°C	NA	7 days
Alkalinity	EPA 310.2	(1) 500 mL[3] plastic bottle	Refrigerate at 4°C	NA	14 days
Aldehydes	EPA 8315A	(1) 500 mL glass bottle	Refrigerate at 4°C	72 hours **	72 hours **
Asbestos (Drinking Water)	EPA 100.1/100.2	(2) 1 L Polyethylene bottle	Chilled	48 hours **	NA
Ammonia	EPA 417B	250 mL plastic bottle	add 2 mL conc. H_2SO_4	NA	NA

(1) From sample collection to extraction/distillation/digestion.
(2) From digestion/extraction to analysis.
(3) Can be analyzed from same bottle.
** These samples must be overnight shipped to the laboratory immediately following collection.
SM = Standard Methods (APHA)
NA = Not applicable

APPENDIX 8.0: Environmental Sample Preservation and Holding Times *(Continued)*

AIR AND SOIL GAS SAMPLES

Parameter	**Reference Method**	**Container**	**Preservation and Storage**	**Holding Time**	
				Extract	Analyze^1
Volatile Organic Compounds	TO-15	Tedlar Bags & Summa Canisters	Separate from standards	NA	Tedlar Bags- 1 week Canisters- 30 days

(1) From sample collection to final acceptable analysis.

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) SAMPLES

Parameter	**Reference Method**	**Container**	**Preservation and Storage**	**Holding Time**	
				Extract^1	Analyze^2
Volatile Organics (VOCs)	EPA 1311 Leaching Procedure	(2) 40 mL VOA vials	Refrigerate at 4°C	14 days	14 days
Extractable Organics		(2) 4 oz. glass jar		14 days	40 days
Mercury			Refrigerate at 4°C	28 days	28 days
Other Metals				180 days	180 days
VOCs	EPA 8260A, EPA 8260B	(2) 40 mL VOA vials	Refrigerate at 4°C	NA	14 days
Semi-volatiles Pesticides Herbicides	EPA 8270C EPA 8081A EPA 8150	(1) 500 mL glass jar	Refrigerate at 4°C	7 days	40 days
Metals	EPA 6010B	(1) 500 mL plastic bottle	Refrigerate at 4°C; add 1 mL conc. HNO$_3$	NA	180 days
Mercury	EPA 7470A	(1) 500 mL plastic bottle	Refrigerate at 4°C; add 1 mL conc. HNO$_3$	NA	28 days

(1) From sample collection to extraction/distillation/digestion.
(2) From digestion/extraction to analysis.
(3) Can be analyzed from same bottle.
** These samples must be overnight shipped to the laboratory immediately following collection.
SM = Standard Methods (APHA)
NA = Not applicable

MINIMUM SAMPLE VOLUMES REQUIRED FOR TCLP EXTRACTION

Matrix	Metals	Volatiles	Semivolatiles	Pesticides	Full TCLP
Aqueous with <0.5% solids	500 mL	4 x 40 mL	1 Liter	1 Liter	3 Liters
Aqueous with >0.5% solids*	*	*	*	*	*
Solid**	150 g	50 g	150 g	150 g	200 g

*Depending upon the % solids, this sample matrix may result in a multiple phase leachate. Sample volumes required are determined following initial sample assessment and consultation with customer.
**This category would include any non-filterable waste (i.e., rags or bag filters).

Appendix 9.0: QUALITY CONTROL PROCEDURES

Appendix 9.0: Quality Control Procedures

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
6010B	**Metals**	Laboratory mixed standard calibration	Daily, prior to analysis	Verify against initial calibration check	1. Recalibrate, if appropriate
		Calibration Blank (CCB)	After initial calibration and continuing calibration verification standards	±3 Standard deviations of the mean blank value.	1. Repeat the analysis two more times and average the results. 2. Rerun samples back to last valid blank analysis. 3. Terminate analysis, correct the problem, recalibrate, and reanalyze the previous 10 samples
		ICP Interference Check (ICSA & ICSAB)	Run at beginning of daily run and at least twice per 8 hour shift	±20% of true value for EPA check sample elements	1. Terminate analysis 2. Correct the problem 3. Recalibrate 4. Reanalyze the previous ICSAB
		Initial Calibration Check (ICV)	After calibration	±10%	1. Rerun 2. Recalibrate if appropriate 3. Modify correction factors as necessary
		Continuing Calibration Verification Standard (CCV)	At least 10% plus end of run	±10%	1. Terminate analysis 2. Correct the problem 3. Recalibrate 4. Reanalyze the previous 10 samples
		Method Blank	With each analytical batch	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Reanalyze blank and samples 3. Re-prepare and reanalyze samples 4. Flag data
		LCS	With each analytical batch	±30% of the actual value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample for failing analytes 3. Re-prepare and reanalyze samples for failing analytes 4. Flag data

Please see method SOPs for specific requirements and corrective actions.

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
		Matrix Spike	With each analytical batch	±25% of the actual value or within laboratory control limits	1. Check for calculation errors, instrument performance 2. Perform post digestion spike 3. Flag data
		Matrix Spike Duplicate	With each analytical batch	±25% of the actual value or within laboratory control limits and ±25% RPD for sample values greater than ten times the instrument detection limit or within laboratory control limits	1. Check for calculation errors, instrument performance 2. Perform post digestion spike 3. Flag data
7470A/7471A	**Mercury**	Five Points	Daily prior to analyses	r2≥0.99	1. Terminate analysis 2. Correct problem 1. Repeat calibration as appropriate
		Initial calibration verification (ICV) & LCS*	After calibration	±10% of true value	1. Terminate analysis 2. Correct problem 3. Repeat calibration as appropriate
		Continuing Calibration Verification Standard (CCV)	Every 10 samples	±20% of true value	1. Terminate analysis 2. Correct problem 3. Repeat calibration as appropriate 4. Reanalyze the previous 10 samples
		Calibration (or Preparation) Blank (CCB)*	After initial calibration and continuing calibrations	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Reanalyze blank and samples 3. Reprepare and reanalyze samples 4. Flag data
7470A/7471A	**Mercury**	MS/MSD	One per analytical batch	±25% of true value & RPD < 20% or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample 3. Re-extract and reanalyze 5. Flag data

* Performs both functions since the sample is carried through all preparation and analysis steps.

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
8015A-modified	**Total Petroleum Hydrocarbons-Gasoline Range**	Five Points	Initially and as required.	$r^2 \geq 0.99$	1. Evaluate system 2. Repeat calibration
		Continuing Calibration Check	Every 10 samples and at the end of the analysis. Beginning of analysis if initial calibration is not required.	± 15% of true value	1. Evaluate system 2. Repeat calibration
		Calibration (or Preparation) Blank*	Each analytical sequence of samples.	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Reanalyze sample 3. Re-extract and reanalyze 4. Flag data
		LCS	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reprepare and reanalyze samples & blank. 3. Flag data
		MS/MSD	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every blank, sample and QC	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample 3. Flag data

* Performs both functions since the sample is carried through all preparation and analysis steps.

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
8015B	**Total Petroleum Hydrocarbons-Diesel Range**	Five Points	Initially and as required.	$r^2 \geq 0.99$	1. Evaluate system 2. Repeat calibration
		Continuing Calibration Check	Beginning of analysis if initial calibration is not required then every 20 samples and at the end of the analysis.	± 15% of true value	1. Evaluate system 2. Reverify calibration or recalibrate as necessary 3. Reprepare and reanalyze preceeding samples, if necessary.
		Calibration (or Preparation) Blank*	Each analytical batch of samples.	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured conc. in the sample.	1. Check for calculation errors, instrument performance 2. Reanalyze blank and samples 3. Re-extract and reanalyze 4. Flag data
		LCS	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reprepare and reanalyze samples & blank. 3. Flag data
		MS/MSD	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every blank, sample and QC	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample 3. Flag data
8020A/8021	**Aromatic Hydrocarbons**	At Least Five Points	Initially and as required	$r^2 \geq 0.99$	Recalibrate as necessary
		Continuing Calibration Check Standard	Daily before sample analysis	± 15% from average of initial calibration curve	1. Evaluate system 2. Reanalyze standard 3. Recalibrate if appropriate

* Performs both functions since the sample is carried through all preparation and analysis steps.

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
8020A/8021 (continued)	**Aromatic hydrocarbons**	LCS	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
		Calibration (or Preparation) Blank*	Each analytical batch of samples.	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Reanalyze blank and samples 3. Re-extract and reanalyze 4. Flag data
		MS/MSD	With each analytical batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every sample	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
8081A	**Organochlorine Pesticides**	Five Points	Initially and as required	$r^2 \geq 0.99$	1. Evaluate system 2. Re-analyze standard 3. Recalibrate if appropriate
		Continuing Calibration Check Standard	Before sample analysis, every 20 samples	± 15% from average of initial calibration curve	1. Evaluate system 2. Re-analyze standard 3. Recalibrate if appropriate
		Calibration (or Preparation) Blank*	Each analytical run/batch	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
		LCS	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reprepare and reanalyze samples & blank. 3. Flag data

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration/QC Sample	Frequency	Acceptance Criteria	Corrective Action
8081A (continued)	**Organochlorine Pesticides**	MS/MSD	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every sample	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
8082	**PCBs (Aroclors)**	Five Points	Initially and as required	$r^2 \geq 0.99$	1. Evaluate system 2. Re-analyze standard 3. Recalibrate if appropriate
		Continuing Calibration Check Standard	Before sample analysis, every 20 samples	± 15% from average of initial calibration curve	1. Evaluate system 2. Re-analyze standard 3. Recalibrate if appropriate
		Calibration Blank/Prep Blank	Each analytical run/batch	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
		LCS	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reprepare and reanalyze samples & blank. 3. Flag data
		MS/MSD	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Reanalyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every sample	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
8260A/8260B	**Volatile Organics**	Tune instrument using BFB	Every 12 hours	Refer to method (SW846)	1. Retune instrument 2. Repeat BFB analysis
		Initial Five Point Calibration	Initially and as needed	Ave. RF ≥0.10 except Chlorobenzene and 1,1,2,2-Tetrachloroethane ≥0.30 & %RSD≤30 for CCCs & Hexane**	1. Evaluate system 2. Recalibrate as necessary
		Continuing Calibration Verification	Every 12 hours	% drift for CCVs, including Hexane*, ≤20%; Average RF ≥0.10 except Chlorobenzene and 1,1,2,2-Tetrachloroethane ≥0.30	1. Evaluate system 2. Recalibrate as necessary
		LCS	One per batch	± 30% of true value or laboratory control limits. Includes Hexane, if requested**	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Flag data
		MS/MSD	One per every 12 hour clock or batch.	± 30% of true value or laboratory control limits. Includes Hexane, if requested**	1. Check for calculation errors, instrument performance 2. Re-analyze sample, if appropriate 3. Flag data
		Surrogate Spike	Every sample	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Flag data
		Method Blank	One per batch	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data

** Hexane is not contained within EPA 8260 analytical methodology, but the laboratory has demonstrated acceptable performance. Hexane is only reported when specifically requested by the customer prior to the analysis of samples.

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
8260A/8260B (continued)	**Volatile Organics**	Internal Standard Recovery	Every sample	Area counts of the internal standard peaks should be between 50-200% of the area of the target analytes in the mid-point calibration analysis & retention time must be within 30 seconds of the internal standard response in the continuing calibration standard.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Flag data
8270C	**SemiVolatile Organics**	Check of instrument tuning criteria using DFTPP	Every 12 hours	Refer to method (SW846)	1. Retune instrument 2. Repeat DFTPP analysis
		Initial five point calibration	Initially and as required;	% RSD for CCCs ≤30% Avg. RF ≥0.050 SPCCs	1. Evaluate system 2. Recalibrate if appropriate
		Continuing Calibration Check Standard	Every 12 hours	RF ≥ .050 for SPCCs % Drift ≤20% for CCCs	1. Evaluate system 2. Recalibrate if appropriate
		Internal Standard Recovery	Every sample	Area counts of the internal standard peaks should be between 50-200% of the area of the target analytes in the mid-point calibration analysis& retention time must be within 30 seconds of the internal standard response in the continuing calibration standard.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
		Calibration (or Preparation) blank	Each analytical run/batch	Less than the highest of either: 1. The method detection limit, 2. Five percent of the regulatory limit for that analyte, or 3. Five percent of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data
		LCS	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze 4. Flag data

Appendix 9.0: Quality Control Procedures *(Continued)*

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
8270C (continued)	**SemiVolatile Organics**	MS/MSD	One per batch	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze, if appropriate 4. Flag data
		Surrogate Spike	Every sample	± 30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-extract and reanalyze, if appropriate 4. Flag data
TO-15	**Volatile Organic Compounds**	Tune instrument using BFB	Every 24 hours	If the BFB acceptance criteria are not met, the MS must be retuned. It may be necessary to clean the source or take other necessary actions to achieve the acceptance criteria	1. Retune instrument 2. Repeat BFB analysis
		Initial five point calibration	Initially and as required;	Low standard must be at the reporting limit. % RSD for CCCs ≤30% of the ICV with two exceptions up to 40%	1. Reanalyze the standard concentrations or check the GC/MS for malfunction.
		Single Point Daily Continuing Calibration Check	Every 12 hours	% Diff. RRF for CCCs ± 30% Mean RRF of ICV with two exceptions up to 40%	1. Evaluate system 2. Recalibrate if appropriate
		LCS	Analyzed daily	±30% (with two compounds up to 40%) of the expected concentration for each analyte on the standard TO-15 target analyte list	1. Instrument is recalibrated and LCS is rerun 2. LCS must pass before samples are analyzed.
		Method Blank	For each daily tuning period	Must contain <0.2 ppb of standard TO-15 target analyte list	1. The blank and/or batch is rerun and the canisters associated with the blank are recleaned and reanalyzed.

8310	**Polynuclear Aromatic Hydrocarbons**	Initial five point, at least, calibration	Initially and as required	$r^2 \geq 0.99$	1. Identify problem, correct system 2. Recalibrate

Appendix 9.0: Quality Control Procedures *(Continued)*

8310 (continued)	**Polynuclear Aromatic Hydrocarbons**	Check standard	Beginning and end of run, after every 20 samples	±15% of true value	1. Recalibrate instrument 2. Rerun samples to bracket by valid checks
		Preparation Blank	One per analytical batch	Less than the highest of either: 1. The method detection limit, 2. 5% of the regulatory limit for that analyte, or 3. 5% of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Flag data
		LCS	One per analytical batch	±30% of true value or laboratory control limits	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Flag data
335.2 (CLP-M)	**Total Cyanide**	Five Point Calibration	Prior to analysis	r2≥0.99	1. Identify problem and correct system 2. Recalibrate
		LCS	Distilled with each analytical batch	±15% of the undistilled standards	1. Identify problem and correct system 2. Recalibrate
		Preparation Blank	Each analytical run/batch	Less than the highest of either: 1. The method detection limit, 2. Five percent of the regulatory limit for that analyte, or 3. Five percent of the measured concentration in the sample.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-distill and reanalyze 4. Flag data
		Sample Duplicate	One per batch	If both the sample and duplicate result are greater than 10 times the reported detection limit, the relative percent difference should be less than or equal to 20%.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. Re-distill and reanalyze 4. Flag data
		Spiked Sample	One per batch	If the sample concentration is ≤ 4X the spike added, the spike recovery should be within ± 25% of the true value.	1. Check for calculation errors, instrument performance 2. Re-analyze sample 3. If LCS is acceptable and spike is not, matrix effect is suspected. 4. Flag data
600/R-93-116	**Bulk asbestos**	Refer to method	Refer to method	Refer to method	Refer to method

Appendix 9.0: Quality Control Procedures *(Continued)*

Review/Check	Frequency	Description	Outlier	Corrective Action
Internal Audit	At least annually	Review of laboratory adherence to written procedures and documents	Event does not conform to written laboratory procedure	1. Identify item in internal audit report. Forward report to laboratory management. 2. Generate Nonconformance/Corrective Action Report (NC/CAR) per laboratory standard operating procedure. 3. Perform follow up review of NC/CAR to assure compliance.
External Audit – Second or Third Party.	As required	Review of laboratory adherence to customer/certifying agency procedures and documents	Event does not conform to customer/agency specifications.	1. Identify and address item. Generate NC/CAR form if item does not conform to written laboratory procedure. 2. Perform corrective action as specified by the customer or agency. 3. Forward written reply to customer or agency as they specify.
Proficiency Test	As required	Test samples submitted by certifying agency	Test results outside of specified acceptance limits	1. Review raw data for reporting errors. 2. Review raw data for analytical errors. 3. Perform corrective action as specified by certifying agency.

Appendix 10.0: NC/CAR REPORT

ALS LABORATORY GROUP NONCONFORMANCE/CORRECTIVE ACTION REPORT (NC/CAR)

(SIDE 1)

IH [ ] ENV [ ] Asbestos [ ] Submitted by:____________________________________
(Print name)

Work Order (s):____________________________ Method:____

Samples:__________________________________ Matrix/Media:_____________________________________

Date Initiated:______________________________ Date of Occurrence:________________________________

DESCRIBE NONCONFORMANCE (PROBLEM):
REVIEWER/MANAGER COMMENTS:
CORRECTIVE ACTION REQUIRED? [ ] YES [ ] NO If yes, go to side 2 of this form. Signature: Date:

QA REVIEW AND APPROVAL	QA COMMENTS:___________________________________
THE AFFECTED ANALYTICAL DATA ARE: [ ] USABLE [ ] USABLE (FLAGGED) *SEE COMMENT [ ] NOT USABLE *SEE COMMENT **CORRECTIVE ACTION REQUIRED?** [ ] YES [ ] NO Reviewed by QA: ______________________________	____ ____ ____ ____ DATE: ______________

Form Revised 4/10

CORRECTIVE ACTION REPORT

(SIDE TWO)

If corrective action is required, complete this side of form also. See other side for details of nonconformance.

CORRECTIVE ACTION TAKEN Technical Director/Designee Comments:	HOW WAS ROOT CAUSE DETERMINED (INVESTIGATION)? WHY DID THE PROBLEM OCCUR (ROOT CAUSE)? WHAT CORRECTIVE ACTION WAS IMPLEMENTED? Corrective Action has been (will be) completed on: ________________________ Date ________________________ Signature EVIDENCE OF CORRECTIVE ACTION RESOLUTION AND NON-RECURRENCE: Manager: ___________________
When complete, route to QC Manager	Date: ______________________
QA REVIEW AND APPROVAL	QA COMMENTS: ______________________________
CORRECTIVE ACTION ACCEPTABLE [ ] Yes [ ] No Reviewed by QA: __________ __________ Initials Date	____ ____ ____

Form Revised 4/10

Appendix 11.0: LIST of CERTIFIED METHODS

Method	*Certifying Body*	
	NELAP	*OH VAP*
Soil		
EPA 300.0 (limit list)		✓
EPA 335.2(CLP-M)	✓	✓
*ENV-004-Asbestos Soil by Lab SOP by PLM	✓	✓
*EPA 600/R-93/116	✓	
EPA 6010B	✓	✓
EPA 7199	✓	
EPA 7471A	✓	✓
EPA 8015A	✓	✓
EPA 8015B	✓	✓
EPA 8020A	✓	
EPA 8081A	✓	✓
EPA 8082	✓	✓
EPA 8260A&B	✓	✓
EPA 8270C	✓	✓
Non-Potable Water		
*ENV-005-Asbestos Water by Lab SOP by TEM		✓
EPA 218.6	✓	
EPA 300.0 (see scope for list of analytes)		✓
EPA 335.2(CLP-M)	✓	✓
EPA 6010B	✓	✓
EPA 7199	✓	
EPA 7470A	✓	✓
EPA 8015A	✓	✓
EPA 8015B	✓	✓
EPA 8020A	✓	
EPA 8081A	✓	✓
EPA 8082	✓	✓

Method	***Certifying Body***	
	NELAP	***OH VAP***
EPA 8260B	✓	✓
EPA 8270C	✓	✓
Air		
TO-4A	✓	
TO-13A	✓	
TO-15(see scope for list of analytes)	✓	✓
EPA 8270C		✓

* Asbestos Methods are covered under another ALS Quality Manual- “Industrial Hygiene and Microscopy Quality Assurance Program Plan”.

MICROSEEPS, INC.
220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

QUALITY SYSTEMS MANUAL

Controlled Copy No. __________

Signatures of Final Approval:

4/10/13

Robert Pirkle
Senior Product Manager

Date

4-10-2013

Patrick McLoughlin Ph.D.
Quality Systems Manager

Effective Date

Organizational Units

Customer Service

Risk

Wet Chemistry

Volatiles

CSIA

E Donors

E Acceptors

Review Date: April 9, 2013

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Review Date: April 9, 2013

1.0 Introduction, Purpose, and Scope

1.1 Introduction

Microseeps, Inc. (Microseeps) recognizes its crucial role in providing reliability and excellence in the environmental analytical industry. The laboratory provides information necessary for engineering, industrial, and regulatory clients to make informed judgments and applicable policy decisions. The laboratory's analytical services also assist clients in complying with major environmental regulations. Microseeps' management acknowledges that uncompromising dedication to quality is fundamental to remaining a competitive force in the analytical services market.

1.2 Purpose

The purpose of this Quality Systems Manual is to outline a program of policies, procedures, and documentation, which assures that our analytical services meet a defined standard of quality on an ongoing basis. This document defines the standards under which all laboratory operations will be performed. As supplemented by Standard Operating Procedures (SOPs), the Quality Systems Manual describes the laboratory's organization, objectives, and operating philosophy.

Microseeps Quality Systems Manual contains references to the laboratory's policies and operational procedures that have been established in order to meet the quality requirements of the TNI Standards and the following Quality Policy Statement.

The laboratory shall continually improve the effectiveness of its management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

1.2.1 Microseeps' Quality Policy Statement

Microseeps is an organization that provides information and environmental services to a very diverse client base. In all processes from initial customer contact to project completion, Microseeps aim is to offer clients a reliable product of the best quality that is delivered in a timely manner at a reasonable price. This Policy Statement represents a top level management commitment and shall be achieved using the following goals:

1. Production of accurate information.
2. Adherence to an ethical standard that demands continuous honesty and integrity.
3. Achievement of customer satisfaction.
4. Establishment of a documented trail to support the results.

5. Maintenance of a pleasant working environment where employees are treated equitably and fairly.

These goals are fundamental to all of Microseeps' actions.

The Standard Operating Procedures and Microseeps Quality Systems Manual detail the procedures for achieving these goals. Management personnel are charged with ensuring all applicable procedures are completed in the spirit of the Quality Policy. They are available to all employees to assist in applying these principles and to advise appropriate action. It is the responsibility of each Microseeps employee to consistently act as directed by the five goals of quality. Further, it is their responsibility to consult their immediate superior for direction if an issue arises for which the response is unclear.

If Microseeps' Director Level Management realizes that these goals are not achievable but the validity and appropriateness of client results is not jeopardized, we will inform affected clients of the situation and allow them to alter their employ of Microseeps' services accordingly. If the client's data are to be negatively impacted where the validity of the results is in question, or a clients' project is operationally or legally jeopardized, the following procedures shall be followed:

1. Concerned operations will be suspended.

2. Affected clients will be notified.

3. Alternative procedures for securing the requested services will be employed until the corrective actions are completed to a level that is consistent with Microseeps' documented procedures and is satisfactory to management.

To achieve these quality goals, all laboratory data must be properly documented, legally defensible, and supported by statistically defined and verifiable confidence limits. Falsification of data under any circumstance is unacceptable and is grounds for termination. Microseeps has an Employee Handbook which provides policies and procedures to help employees avoid involvement in any activities that would diminish confidence in Microseeps competence, impartiality, judgment and/or operational integrity.

Microseeps uses EPA-approved methodologies such as those found in Standard Methods and SW-846, whenever methods are available. If an EPA-approved method has not been specified, Microseeps will select an industry recognized and validated method for use or will develop an internal method based upon thorough research and good scientific methods. In all instances of scientific innovation, Microseeps recognizes the value of a firm commitment to quality and integrity.

1.3 Scope of Quality Systems Manual

This document serves as both the Microseeps, Inc. Quality Systems Manual and the Microseeps Laboratory Quality Assurance Plan. It contains both quality assurance policies and quality control procedures that are followed to ensure and document the quality of analytical data. This manual provides detail concerning quality management requirements employed at Microseeps for the documented acquisition of samples, analysis of those samples via specific tests, the reporting of that data to the client, and the ultimate disposal of samples.

1.4 Scope of Services

Microseeps offers a comprehensive scope of laboratory analytical services to environmental consultants, industries, governmental agencies, and municipalities. The scope of services include:

Wastewater, storm water, solid waste, and hazardous waste analyses

- Volatile analyses via GC/MS
- Ion analysis via Ion Chromatography
- Wet Chemistry analyses for pH, alkalinity, TOC, and sulfide.

Intrinsic Bioremediation Analysis

Training Seminars

Soil Vapor Extraction Analysis

1.5 Certifications

Microseeps holds the following certifications:

- National Environmental Laboratory Accreditation Program (NELAP): Pennsylvania
- Florida
- Connecticut
- Virginia
- South Carolina
- Louisiana
- Texas
- New York
- New Jersey
- New Hampshire

Specific parameter lists for the various certifications are available from the Customer Service Department upon request.

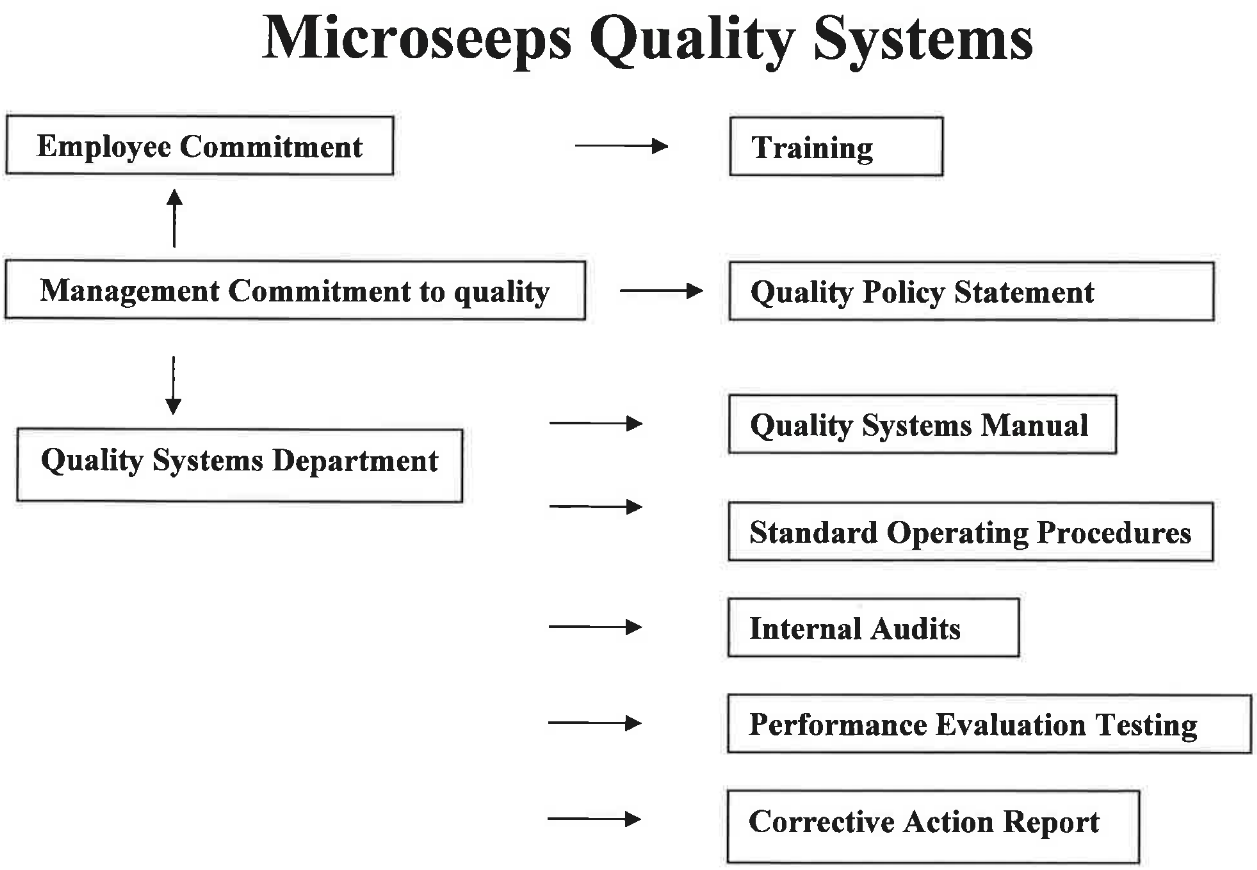
Review Date: February 1, 2012

2.0 Quality Systems – Establishment and Audits

2.1 Establishment of a Quality System

Microseeps has established a quality system based upon the fundamentals of good laboratory practices and the requirements outlined in the TNI Standard of the National Environmental Laboratory Accreditation Program. Although Microseeps provides a variety of environmental services, Microseeps' Quality System has been designed according to the type, range, and volume of analytical testing activities undertaken in the laboratories. This section describes Microseeps' Quality System and outlines the policy and procedures for implementing corrective action when non-conforming work or departures from policies and procedures occur.

2.2 Elements of Microseeps Quality System



This flowchart shows the general elements of Microseeps Quality Systems. Each area of this flowchart is addressed or referenced in this Quality Systems Manual.

2.2.1 Quality Manual Review

The Microseeps Quality Systems Manual is reviewed annually for accuracy and applicability. These records are maintained in the Quality Systems Coordinator's Office. All revisions will be conducted in accordance with Microseeps Standard Operating Procedure for Document Control.

2.2.1.1 Document Control

Document control procedures are specified in Microseeps Standard Operating Procedure for Document Control SOP-ADM 5. The Standard Operating Procedure outlines document control procedures for generating, formatting, revising, approving, tracking, distributing, indexing, archiving, and destroying controlled documents, including the Quality Systems Manual.

2.2.2 Internal Audits

Technical audits serve to verify compliance with method-specific procedures including operations related to test methods. Any audit that is conducted on an operation that is involved with data generation and the assurance of its quality is a technical audit. System audits function to verify compliance with the laboratory's quality system. Types of procedures that would be reviewed as a part of a systems audit could include: (1) response to complaints; (2) sample tracking methodologies; and (3) sample acceptance policies.

The Quality Systems Department will coordinate all technical and system audits. Audits shall be conducted by individuals who are independent of the activity to be audited. All internal auditors shall be trained and qualified in the areas in which they will be conducting the audit.

2.2.2.1 Audit Frequency

Internal Audits are scheduled and may be conducted by the Quality Systems Department and may either be scheduled or unannounced. Microseeps conducts internal technical audits and internal system audits at least annually. The audits are conducted to insure that Microseeps' operations continue to comply with the Quality Systems requirements specified in the Quality Systems Manual and Standard Operating Procedures. The Quality Systems Coordinator maintains an audit schedule to ensure that all laboratory groups and programs are audited.

2.2.2.2 Procedures for Internal Audits

Audits will be conducted on analytical groups or systems according to the annual audit schedule posted in the Quality Systems Coordinator's Office. Immediately prior to starting the audit Operations will be notified. Microseeps' Standard Operating Procedure ADM-4 for Internal Laboratory Audits outlines the specific procedures for conducting an internal audit.

According to the SOP, the audit is performed using the appropriate audit check sheet as a guide. The audit check sheet will be selected and used as the auditing guide for the area that is to be audited. The audit check sheets delineate the activities and records that will be reviewed. The sheet is completed and additional notes are made by the auditor based upon observations, interviews, and record reviews.

2.2.2.3 Internal Audit Findings and Corrective Action

Using the audit check sheets and supplementary notes, an Internal Audit Report (Figure 2-1) is prepared by the Quality Systems Coordinator. The Internal Audit Report contains an overall summary of the audit, including both items of a positive nature, as well as deficiencies. The cause of each deficiency is determined using Root Cause Analysis. Root Cause Analysis is the foundation upon which all Corrective Action is based. This process and an example are outlined in Figure 2-2 in this Quality Systems Manual.

Corrective Action based upon the root cause analysis is indicated on a Corrective Action Report (see Figure 2-3). A Corrective Action Report is prepared for each deficiency listed on the Internal Audit Report. The Internal Audit Report and Corrective Action Report are forwarded to the appropriate Department Head for corrective action. A follow-up audit is conducted.

If the audit was of a technical nature, the Audit Report will be forwarded to the Laboratory Manager. The Laboratory Manager will meet with the specific Department Head the first business day once the audit findings are received. The audit will be discussed along with the recommendations for corrective action. Corrective action is expected to take place immediately or as soon as possible following the audit. A follow-up audit of any deficient area(s) will be conducted within one week of audit completion, or as soon as corrective action is completed in order to monitor the effectiveness of corrective action.

Where any audit findings or defective measuring or test equipment may cast doubt on the correctness or validity of the laboratory's calibrations or test results, Microseeps shall take corrective action as specified in Microseeps' Quality Policy Statement. If the subsequent investigation shows that laboratory results have been affected, the affected client shall be notified in writing by the Customer Service Office.

2.2.2.4 Work Stoppage

The Quality Systems Department has the authority to stop any work that is found to be unsatisfactory or to prevent reporting of unjustifiable results. The work will not be ordered to commence until corrective action is taken that insures satisfactory work and reliable results according to the Quality Systems Department's discretion.

2.2.3 Performance Evaluation Audits

Performance evaluation audits enable Microseeps to measure the precision, accuracy, and comparability of laboratory-generated data through the use of blind reference materials. Microseeps participates in performance evaluation studies required by the EPA and several state agencies. Performance evaluation studies are completed as required to maintain necessary certifications, and as required as an integral part of an internal audit at the Quality Systems Department's discretion.

Performance evaluation studies for all accredited parameters are planned for testing at least twice each year. The Quality Systems office maintains EXCEL spreadsheets of results so that trends are easily noticeable.

In situations where the analyst is to know that a performance evaluation is being conducted, the analyst prepares the samples according to the instructions provided. If the PE is to be a blind audit, the Quality Systems Department prepares the samples. The samples are analyzed as soon as possible after opening the vials to avoid sample deterioration. Prior to reporting the results to the appropriate agency, the Laboratory Manager and the Quality Systems Manager evaluate results of the performance evaluation samples.

2.2.3.1 Performance Evaluation Findings and Corrective Action

Once the evaluation report from the Performance Evaluation Provider or appropriate agency is received, the Quality Systems Coordinator forwards the findings to the Laboratory Manager. Unacceptable results are investigated to determine the root cause of the failures. The following points are addressed during the investigation:

- Potential for reporting/calculation errors
- Preparation of calibration standards
- Evaluation of quality control data associated with the analysis
- Evaluation of analytical technique and instrument performance

Additional Performance Evaluation samples may be submitted for analysis if the Quality Systems Department determines it is necessary to ensure that an analytical method, technique, or instrument performance problem is corrected.

2.2.4 External Audits

External Audits are conducted as necessary to retain laboratory certifications or at a client's request. The Quality Systems Department is the liaison between Microseeps and an external auditor. The Quality Systems Department is responsible for notifying the laboratory staff of upcoming audits. This notification will include the agency that will perform the audit, the reason for the audit, the dates involved, and the areas of concern.

During the audit, laboratory personnel will be available to the auditor as requested, as will any documentation necessary for the auditor to obtain sufficient information to effectively evaluate the laboratory. If laboratory information of a proprietary nature is necessary to complete an audit, the auditor will be required to complete and sign Microseeps Confidentiality Agreement.

2.2.4.1 External Audit Findings and Corrective Action

The Quality Systems Department will prepare a report summarizing the findings of the post audit meeting. Following review of this report, any deficiencies noted by the auditor that affect the validity of data in any area will be addressed immediately. Corrective action will be taken to eliminate the cause of a deficiency and to prevent recurrence. The Corrective Action process shall identify and implement corrective actions to eliminate the root cause of the deficiency. The development and implementation of a corrective action plan shall not be contingent upon the receipt of the external auditor's report.

When the External Audit Report is received at Microseeps, deficiencies will be addressed in the order of their priority as determined by the auditor. The Quality Systems Department will prepare a response plan for correcting the reported deficiencies and will submit a Corrective Action Plan to the auditing agency. Corrective action will be taken according to the timetable outlined by the plan.

2.2.5 Managerial Review

Laboratory Management shall conduct a review of the Quality System and its testing and calibration activities. This review shall be conducted to ensure the Quality System's suitability and effectiveness and to introduce any necessary changes or improvements in the quality system and laboratory operations. This review shall be conducted annually by department level management or higher.

The review will be conducted in the same manner as an Internal Systems Audit, but the auditors will be made up of department level management. Microseeps' Standard Operating Procedure ADM-4 includes an Audit Check Sheet for the Managerial Review Process, which outlines the review procedure.

2.2.5.1 Managerial Review Findings and Corrective Action

The review findings shall be documented on an Audit Report Form and submitted to the Quality Systems Department for review. Corrective Action Reports will be generated for the audit deficiencies and will be resolved as necessary. A timeline for resolution is specified on the Corrective Action Report and the review findings become an item for discussion at the Executive Board meeting where management ensures the corrective actions are completed.

2.2.5.2 Executive Board Meetings

Regular discussions of quality assurance issues are necessary to provide a forum in which upper management are informed of problems and changes that affect the laboratory operations. The Quality Systems Department regularly provides a report to the President and Senior Business Executive, to discuss quality issues. These meetings serve as a general review of factors affecting quality and will include the following topics at a minimum:

- Personnel changes
- Instrument changes
- Internal and External Audit findings
- Certification changes
- Testing and calibration activities
- Quality System implementation activities and progress

2.2.5.3 Documentation

At the end of the meeting, the Director of Finance will document the results of the meeting, prepare a summary of the discussion, and set an agenda for additional follow-up, if required. This report shall serve as documentation of management commitment to the Quality System. A report of each meeting will be kept on file in the Quality System Coordinator's Office.

2.3 Additional Quality Control Checks

In addition to periodic audits, Microseeps ensures the quality of results provided to clients by implementing additional checks to monitor the quality of the laboratory's analytical activities. Some of these checks are as follows:

- Use of certified standards in many of our quality control samples
- Replicate testing using the same and different test methods
- Correlation of results for different but related analysis of a sample
- Participation in Proficiency Testing

2.4 Audit and Review Documentation

All audit records shall be kept on file in the Quality Systems Coordinator's Office. These records shall be available for external auditors, as well as, individuals involved in a Managerial Review of the Microseeps Quality System. This documentation will include:

- Audit Check Sheets
- Audit Report Forms
- Corrective Action Reports

2.5 Corrective Action

An integral part of Microseeps' Quality Systems Program is the system for identifying, reporting, and correcting deficiencies in the laboratory operation. There are several areas in the laboratory that may require corrective action. It is the responsibility of every employee to be aware of potential problems and to notify the appropriate personnel of situations requiring corrective action.

2.5.1 Problem Isolation and Identification

Identification and isolation of problems in the laboratory are not always easy tasks. The need to perform corrective action may become apparent at any point of the analytical process. Corrective action should be initiated and documented as soon as a problem becomes evident. The analyst at the bench detects some situations such as malfunctioning equipment. Corrective action for these situations takes the form of repairing the instrument, either internally or through the use of a service call. The corrective action is documented in the instrument maintenance log and the data obtained just prior to the failure is closely scrutinized for acceptability.

Other situations may not be easily identifiable. For example, systematic drift or sensitivity fluctuations may not be identified until the time that data is validated. Other occurrences that may trigger the need for corrective action include the following:

- Recoveries for surrogates, matrix spike, matrix spike duplicates, and laboratory control standards outside of acceptance limits.
- Percent differences for duplicate analyses outside acceptance limits.
- Trends noted in quality control data.

Out of control events that concern sample analysis and data generation must be documented in a Case Narrative, which becomes a permanent part of the client's project file and final data report.

2.5.2 Sample Handling Problems

Problems involving sample handling may include missing or broken containers, discrepancies between the chain of custody and actual shipment, improperly preserved bottles, insufficient volume, and missed holding times. When one of these problems is identified, a Non-Conformance Form is completed and acted upon in accordance with the Standard Operating Procedure for Sample Receiving (SOP-S2). If necessary, the client is contacted to discuss possible resolutions to the problem. The Non-Conformance Form becomes a part of the client's permanent file.

2.5.3 Sample Analysis Problems

Problems incurred during sample analysis may bring procedures and data into question. These problems may include the following:

- Unacceptable calibration
- Improper procedures
- Unacceptable blank, LCS, and/or surrogate recovery
- Quantitation error
- Required QC not performed
- Retention time shifts

Resolving these problems may include preparing and analyzing the samples a second time, re-calibrating the instrument, or making new standard solutions and reagents. Standard Operating procedures detail corrective action steps that are specific to an analytical procedure. The documentation becomes part of the client's permanent file.

The person identifying the problem documents the situation and identifies possible sources of the problem. If this individual can immediately correct the situation, for example, by re-calibrating the instrument, they will do so and document the action that was taken in the case narrative. If the problem cannot be corrected immediately, the person documents the situation and notifies the Laboratory Manager. The Laboratory Manager is responsible for ensuring that the appropriate corrective actions are followed.

2.5.4 Corrective Action Reports

A Corrective Action Report (CAR) will be completed for each audit deficiency, legitimate issue reported, and any systemic out of control event that occurs. Microseeps has instituted a procedure for reporting when departures from documented policies, procedures, and quality control have occurred. The CAR is a means for anyone in the company to communicate quality concerns to the Technical Department. These forms are a part of Microseeps' Quality System, which provide an avenue for all employees to reflect a genuine concern for quality throughout the company. The CAR is also used to document Customer Complaints and initiate the process of resolving those complaints. All items pertaining to the Customer complaint shall be recorded on the CAR including investigation results and resolution to the satisfaction of the client. All Corrective Action Reports that deal with Customer Complaints shall be kept on file in the Quality Systems Coordinators office.

All CAR's will be followed up to ensure that the corrective actions taken have been effective. The Quality Systems Coordinator is responsible for maintaining a supply of forms. To track the corrective action, each CAR will be given a unique identifier in the form of YY-XXXX where:

- YY = the year in which the CAR was initiated and
- XXXX = is the sequential number of the record starting with 0001

2.5.4.1 Corrective Action Report Initiation and Procedures

A Corrective Action Report may be generated by anyone in the company who discovers and can correct a systemic out of control event. There are two types of situations in which an employee will generate a CAR. First, when the root cause is obvious to the person who discovered the out of control event, and secondly when the root cause is not obvious.

In the first situation, the person who discovers an out of control event shall institute and document corrective action by completing the top portion of the CAR (above the dotted line). They will enter their name, the current date, a description of the event that needs corrective action, and the specific corrective action that was taken. The analyst or Department supervisor shall be notified of the event and the corrective action necessary to solve the non-conformance. The person who completes the corrective action shall sign the form and forward it to their immediate supervisor for a signature. The form will then be forwarded to the Quality Systems Department for cataloging. If additional action is required, the form shall be returned to the department concerned and returned to the Quality Department when corrective action is complete.

If the root cause is not immediately obvious, the Quality Systems Department shall be notified immediately to assist in Root Cause Analysis and determining the appropriate corrective action.

The Quality Systems Department will forward a copy of the CAR to the Laboratory Manager. If it is determined that the client needs to be notified of the incident, the Quality Systems Department shall forward a copy of the CAR to the Customer Service Department and they shall notify, in writing, any client whose work may have been affected within 48 hours of identifying the problem.

2.5.4.2 External Audits and Performance Evaluation Studies

The Quality Systems Department will initiate CAR(s) in response to third party audits and deficiencies on performance evaluation studies. In the case of third party audits, if the resolution to the finding is easily identifiable, the Quality Systems Department will discuss the situation with the Laboratory Manager and the corrective action will be implemented. If the finding concerns a procedural change or is interdisciplinary, the Quality Systems Department will form a task team to investigate the problem and develop an appropriate course of action. The task team's findings will be presented to the Quality Systems Department for discussion and possible implementation. Once a corrective action plan is implemented, the situation will be monitored for a reasonable period of time to ensure that the action has been effective.

The Quality Systems Department will prepare a report for management that summarizes all corrective actions (See Figure 2-4). The report will provide a brief description of the problem, the steps that are being taken to correct the situation, and the status of the item.

2.6 Preventive Actions

The preferred course of laboratory quality and improvement is to identify opportunities for improvement rather than react to the occurrence of problems or complaints. Microseeps is continually seeking ways to improve its performance and product. When these areas are identified, a plan is developed by the staff, usually including the Quality Systems Department, Laboratory Manager, Natural Attenuation Services Product Manager and the CSIA Product Services Manager. Preventative actions are implemented according to the time table specified in the plan. Preventive action procedures include follow-up actions and applications of controls in order to ensure effectiveness. The laboratory seeks both negative and positive feedback from its customers. Feedback provides acknowledgement, corrective actions when needed, and opportunities for improvement. A statement printed on the front page of all final reports gives an avenue for customers to provide comments to us on our performance. Random surveys may also be used as a means to gather feedback from customers. This information is forwarded to the Quality Systems Department.

2.7 Management Arrangements for Permitting Departures from Documented Procedures or Standard Specifications

It is Microseeps management's intent to ensure that documented procedures are followed. Rarely, a situation may occur that requires a departure from documented quality procedures. When this type of situation occurs, the Quality Systems Department and Laboratory Manager, and any other manager whose department may be affected, will discuss and unanimously agree upon the action to be taken. The departure will be documented in memo form and kept on file in the Quality System Coordinator's Office. Corrective action will be taken as soon as possible to prevent the necessity of the departure from reoccurring.

Review Date: April 9, 2013

Figure 2-1

Internal Audit Report

Audit Date: ____________________________ **Department:** __________________________

Auditors: ____________________________

Lead Analyst/Supervisor: ___________________________________

Employees Present: ____

Audit Summary:

Areas of Excellence:

Deficiencies:

Suggestions:

Technical Director Signature: _________________________________ **Date:** _______________

Figure 2-2

Root Cause Analysis

Deficiencies are always analyzed from the non-conformance back to the root cause as follows:

Flow Diagram	**Example**
Deficiency	Results of a laboratory standard out of compliance
↓	↓
Direct Cause	Mistake made in measuring the reagent
↓	↓
Contributing Causes	Analyst failed to use Class A Glassware and didn't know how to pipette correctly.
↓	↓
Root Cause(s)	Lack of training Lack of supervision

Figure 2-3

Corrective Action Report

This form is to be initiated by the person who discovers an event that needs corrective action. Please complete only the portion of the form above the dotted line. When complete, forward to the Quality Systems Department.

Initiated by: ____________________________ **Date:** ___________
Print Name

Description of the event needing corrective action and corrective action required.

Root Cause: ____

This Corrective Action must be acted upon in the time frame indicated below:

Immediately ___ **One Week** ___ **Two Weeks** ___ **Other** ________________
Est. Date

Corrective Action Taken: **Due Date:**

Action Completed by: ______________________________ **Date:** _________________

Supervisor Review: ______________________________ **Date:** _________________

Project #: ____________________ **Sample Numbers:** ______________________

Additional Action: is___ is not ___ necessary. Customer Contact: is___ is not ___ necessary.

Action Closed: ________________________________ **Date:** _______________

cc: Laboratory Manager, Technical Director **CAR #** ________

Figure 2-4

uality Systems Update and Corrective Action Summary Report **Date:__________**

AR #	Date	Summary	Resolution	Responsibilit

uality System

E's:

nternal Audits:

xternal Audits:

OP review/revision:

ertification status:

uality System Manual review/revision:

his report was presented to Microseeps Executive Board on ________________. The board collectively reveiwed it and, s necessary, discussed the appropriate directives that would improve the quality system.

ignature: ___________________________________ Date: _______________

3.0 Organization and Management

Microseeps is a small business as defined by Standard Industrial Classification 8734. Since Microseeps is a business that must compete in a marketplace characterized by merger and consolidation, it is even more important to have an efficient organization with well-defined responsibilities. The purpose of this section is to describe the organization and management structure of Microseeps, interdepartmental and intradepartmental relationships, and to detail employee responsibilities and qualifications.

3.1 Microseeps Organization

Organizations must have a framework within which to achieve their objectives. Organizational structure determines the configuration of positions, duties, and channels through which performance is controlled and authority is delegated. It is crucial that a company use a structure that enables it to realize competitive advantages.

In order for Microseeps to achieve its stated objectives for the quality of its analytical services, all employees must be able to function within a structure that provides an emphasis on quality from a technical standpoint. A functional organizational structure is specifically suited to this purpose.

3.1.1 Organizational Structure

Microseeps' organizational structure is functional. This type of structure is centralized, which restricts decision-making authority to higher levels of management. Company organization is departmental and is specialized and arranged according to function.

The Quality Systems Department reports directly to the Senior Business Executive. Microseeps' Organizational Chart is depicted in Figure 3-1.

3.1.2 Interdepartmental Relationships

Responsibility and dedication to quality laboratory practices and procedures begin at the highest level of management. It is the duty of Senior Management to assure that the framework is in place to provide quality systems guidelines. It is the duty of Microseeps managers to implement the policies and procedures and to see that they drive the activities of the laboratory.

3.1.2.1 Natural Attenuation Services

The Product Manager oversees all analytical departments responsible for providing analyses to support natural attenuation monitoring. The Laboratory Manager works with the analytical work groups in the laboratory to meet quality and turnaround objectives. The Manager for IC analyses coordinates the activities for analysts responsible for anion, cation, and VFA determinations. This responsibility includes final review of raw and QC data. The Laboratory Manager has direct supervision for analysts involved with determinations for wet chemistry parameters, volatile organics, fatty acids by GC, and dissolved and permanent gas determinations. His position includes data review, final report technical review, and implementation of the QC program.

3.1.2.2 CSIA Services

The Product Manager for CSIA services directs the activities of the CSIA analytical staff in regards to routine analytical procedures and method development for isotope analyses.

3.1.2.3 Customer Care

The Customer Care department serves as a liason between the customer and laboratory staff. Personnel within the department serve as sales and marketing, provide quotes, prepare and ship bottle orders, and perform completion review of final reports.

3.1.2.4 Quality Systems Department

The Quality Systems Department operates outside of the scope of the analytical departments in lines of authority. Responsibility for the Quality Systems Department falls upon the Quality Systems Manager who reports directly to the Senior Business Executive. The Quality Systems Manager is responsible for the development, implementation, communication and maintenance of quality systems policies and procedures. A primary goal is to achieve joint cooperation of the operational functions within the company while addressing regulatory requirements in an effective, timely and responsible manner.

The Quality Systems Coordinator is administratively responsible for quality assurance and quality control, and may serve as the Quality Systems Manager's representative in his absence.

3.1.3 Intradepartmental Relationships

The Quality Systems department has a quality assurance and quality control role to fulfill within each department at Microseeps. Discrepancies in quality in any department will be relayed from the Quality Systems Manager to the appropriate department using a format that is appropriate for the type of discrepancy and recommending an appropriate corrective action using a Corrective Action Report.

3.2 Personnel Qualifications

All of Microseeps employees are responsible for complying with the applicable job specific quality assurance and quality control requirements. All staff are to familiarize themselves with the quality documentation and implement the policies and procedures contained in this Manual in their work. Each staff member, including contracted and additional technical and key support personnel should they be required, must demonstrate a combination of formal education and experience to satisfactorily perform their particular function, as well as, a general knowledge of laboratory operation, quality assurance, quality control, test methods, and records management. All personnel are placed in a work group or department with adequate supervision that ensures the employee works in accordance with the laboratory's Quality System. Documentation of employee proficiency for specific job functions and test methods is maintained in the Quality Systems Coordinator's Office.

The Laboratory Manager, based upon specific educational and experience requirements, makes laboratory job assignments. Laboratory analysts are assigned a job classification according to the level of formal education and related laboratory experience they possess.

Basic duties of key staff (those included in Figure 3-1) are discussed below. Complete job descriptions for key staff are contained in Appendix A of this Quality Systems Manual. Complete documentation of all employee job descriptions is kept on file in Employee Personnel Files in the Senior Business Executive's office.

3.2.1 Senior Product Manager

The Senior Product Manager is responsible for overall company performance. He is responsible for new business development and the financial integrity of the company. He represents Microseeps at trade shows and environmental conferences.

3.2.2 Senior Business Executive

The Senior Business Executive works closely with the Senior Product Manager to provide overall direction for the laboratory operation. He is responsible for identifying potential new markets and shares the responsibility for the financial integrity of the laboratory with the Senior Product Manager. Additionally, he approves capital expenditures and evaluates current market conditions to maintain the laboratory's competitiveness.

3.2.3 Product Manager Natural Attenuation/Product Manager CSIA

Product Managers for Natural Attenuation and CSIA are responsible for implementing and enforcing laboratory policies and procedures. They are responsible for the daily operation of each analytical department of the laboratory and are responsible for overseeing the routine expenditures and for maintaining the laboratory's budget.

3.2.4 Laboratory Manager

The Laboratory Manager is responsible for ensuring that Microseeps' goals of providing accurate and verifiable analyses are met. It is the Laboratory Manager's responsibility to ensure that all analytical personnel have the required qualifications and training for their positions. Once qualified personnel are in place, the Laboratory Manager, in conjunction with the Quality Department, will be responsible for assuring that all employees are thoroughly familiar with the Quality Systems Manual and accepted laboratory practices. The Laboratory Manager oversees the daily management of the laboratory staff. A major component of this particular responsibility is the integrity of laboratory reports. The Laboratory Manager's qualified designee will review and approve all outgoing reports. In the absence of the Laboratory Manager, the Product Managers will assume these responsibilities.

3.2.5 Quality Systems Manager

The Quality Systems Manager is ultimately responsible for ensuring that the data produced by the laboratory are technically sound and of the highest quality possible. The Quality Systems Manager serves as the focal point for quality assurance and quality control and is responsible for the oversight and/or review of quality control data. This position notifies laboratory management of deficiencies in the quality system and monitors corrective action. The Quality Systems Manager reports directly to the Senior Business Executive.

3.2.6 Instrumentation Specialist

The Instrumentation Specialist is responsible for ensuring instrument repairs are conducted in a timely and cost effective manner. He implements plans for method development. The Instrumentation Specialist reports to the Senior Product Manager.

3.2.7 Director of Customer Care

The Director of Customer Care provides direction and supervision to ensure that clients receive the best service possible. This position reviews proposal submittals and proposes pricing strategies for potential projects. This position reports to the Senior Business Executive.

3.2.8 Quality Systems Coordinator

The Quality Systems Coordinator assists the Quality Systems Manager to ensure that Microseeps Quality Systems Policies and Procedures are being followed. This is accomplished by: (1) Reviewing data validation procedures; (2) Alerting the analysts should the need for corrective action exist; (3) Performing internal audits; (4) Establishing a periodic schedule for analyzing performance evaluation samples; and (5) Maintaining Quality Control records. The Quality Systems Coordinator reports to the Quality Systems Manager.

3.2.9 Office Manager

The Office manager is responsible for all general office management duties to include updating the vacation calendar, maintenance of the phone system, shipping activities, inventory of office supplies and ordering, scheduling routine copier maintenance, and coordinating facility maintenance with the leasing company.

3.2.10 Sample Custodian

The Sample Custodian is responsible for properly receiving and logging-in all samples received at Microseeps and ensuring that storage and documentation requirements are met. This position also unpacks and marks the samples with the correct internal laboratory identification number so that the client's samples can be tracked through the laboratory. The Sample Custodian is responsible for documenting all discrepancies between samples received and accompanying chains of custody and for notifying customer service so that the client may be contacted. The Sample Custodian reports to the Director of Customer Care.

3.2.10 Laboratory Analyst

Laboratory Analysts are responsible for retrieving samples from Sample Receiving and observing all internal custody requirements. The analysts shall ensure that aliquots analyzed are representative of the entire sample. All analyses shall be conducted according to Microseeps Standard Operating Procedures. Responsibilities also include following good laboratory practices in carrying out duties assigned, and complying with all safety regulations applicable to their respective laboratories. Analysts report directly to the Lab Manager.

3.2.11 Customer Care Representative

The Customer Care Representative is responsible for overseeing in-house analytical projects. It is the Customer Care Representative's responsibility to accurately communicate project requirements to the Laboratory Manager so that projects are logged-in, analyzed, and reported in the format, timeframe, and within the project-specific protocols required by the client. This position reports to the Director of Customer Care.

3.2.12 Bottle Preparation Technician

The Bottle Preparation Technician is responsible for accurately preparing sample containers in a timely and safe manner according to client specification. The Bottle Preparation person also maintains records of standing orders and ensures they are prepared for the courier and for shipment when appropriate. This position also prepares purchase orders for ordering supplies as needed. The Bottle Preparation person also maintains the Bottle Preparation room and storage area in a neat and orderly manner. This position reports to the Director of Customer Care.

3.3 Contract Review, Design Control, and Quality Planning

The Customer Service Department shall use the flow diagram shown in Figure 3-2 as an initial review of all new work that comes in to the laboratory. A project manager shall be assigned to the project if so designated by the flow diagram. When the contract or scope of work specifies two or more of the requests on the left side of the flow diagram, the assigned project manager shall initiate a Contract Review Checklist (see Figure 3-3) and forward it to the departments concerned.

The contract and/or scope of work shall be reviewed by each department concerned to determine if Microseeps has adequate facilities and resources to complete the work in the contract appointed time frame. Each department is to indicate on the form whether their department can or cannot meet the contract requirements, initial and date the form, and return it to the Customer Care Representative within the due date specified on the checklist. If a department cannot meet the requirements of the contract or scope of work, the department is to indicate the reason(s) for that decision on the back of the Checklist prior to returning it to the Customer Care Representative.

The client shall be informed and a resolution discussed if the laboratory review of capability indicates any potential conflict, deficiency, lack of accreditation status, or inability on the laboratory's part to complete the clients work. Any differences shall be resolved to the satisfaction of the laboratory and the client prior to commencement of work.

All records of Contract Reviews, including any significant changes, are maintained in the Customer Care Contract files. Customer Care also maintains records of discussions with the client relating to the client's requirements and the results of the work during the period of the execution of the contract. Correspondence with the client pertaining to laboratory activities for a project are maintained in the Client Project File. The client shall be notified of any deviation from the contract, including accreditation changes that affect the contract.

In the event that the contract needs amended after work has commenced, the same contract review procedures shall be repeated and any changes shall be communicated to all affected personnel.

Review Date: January 29, 2013

Figure 3.1 Microseeps Organizational Chart

Business Management

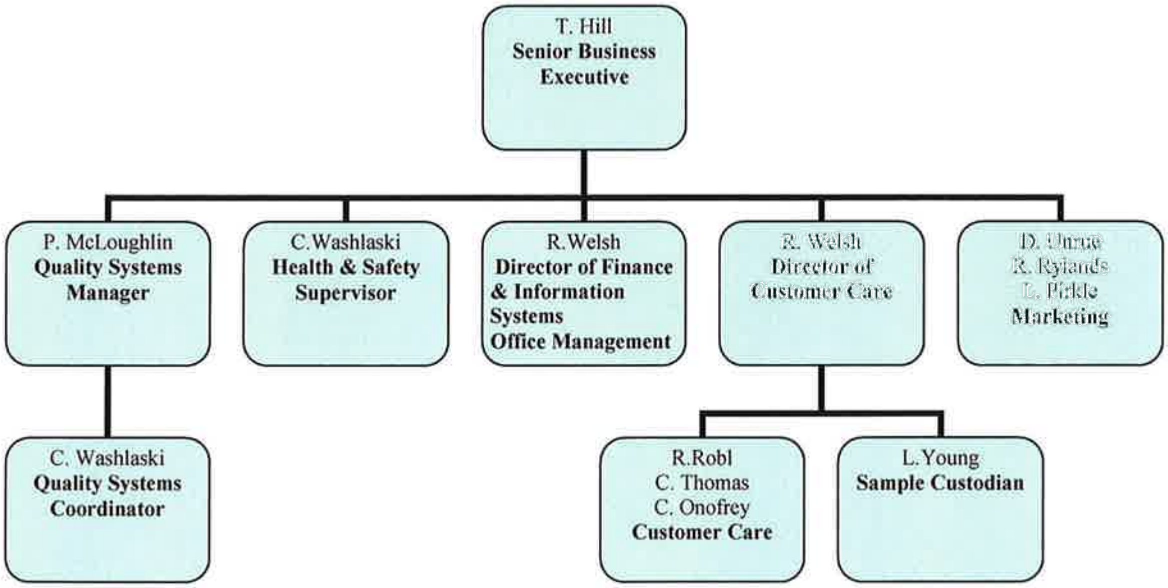


Figure 3.1 Microseeps Organizational Chart

Product Management

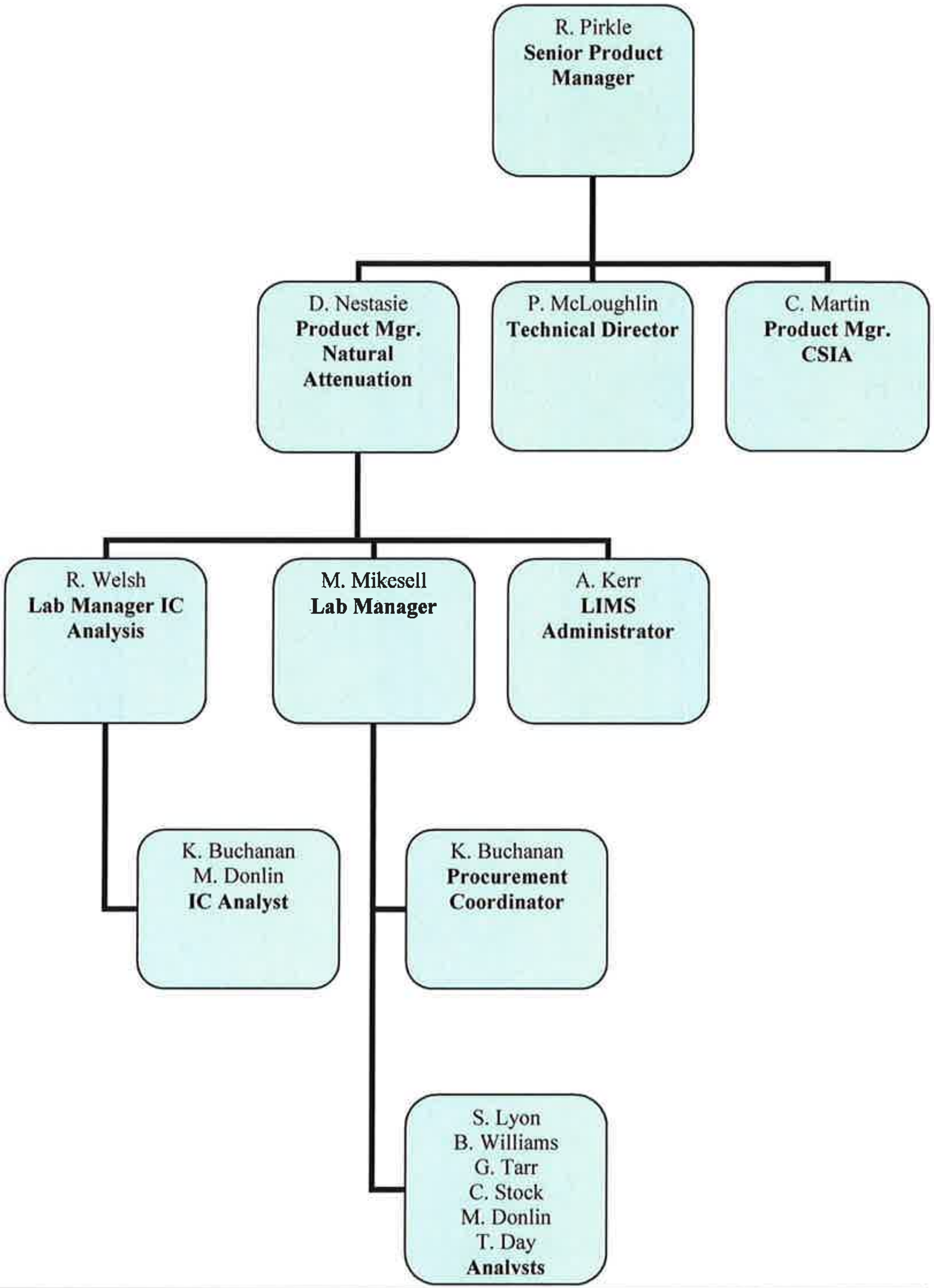


Figure 3-2

Flow Diagram for Contract Review, Design Control, and Quality Planning

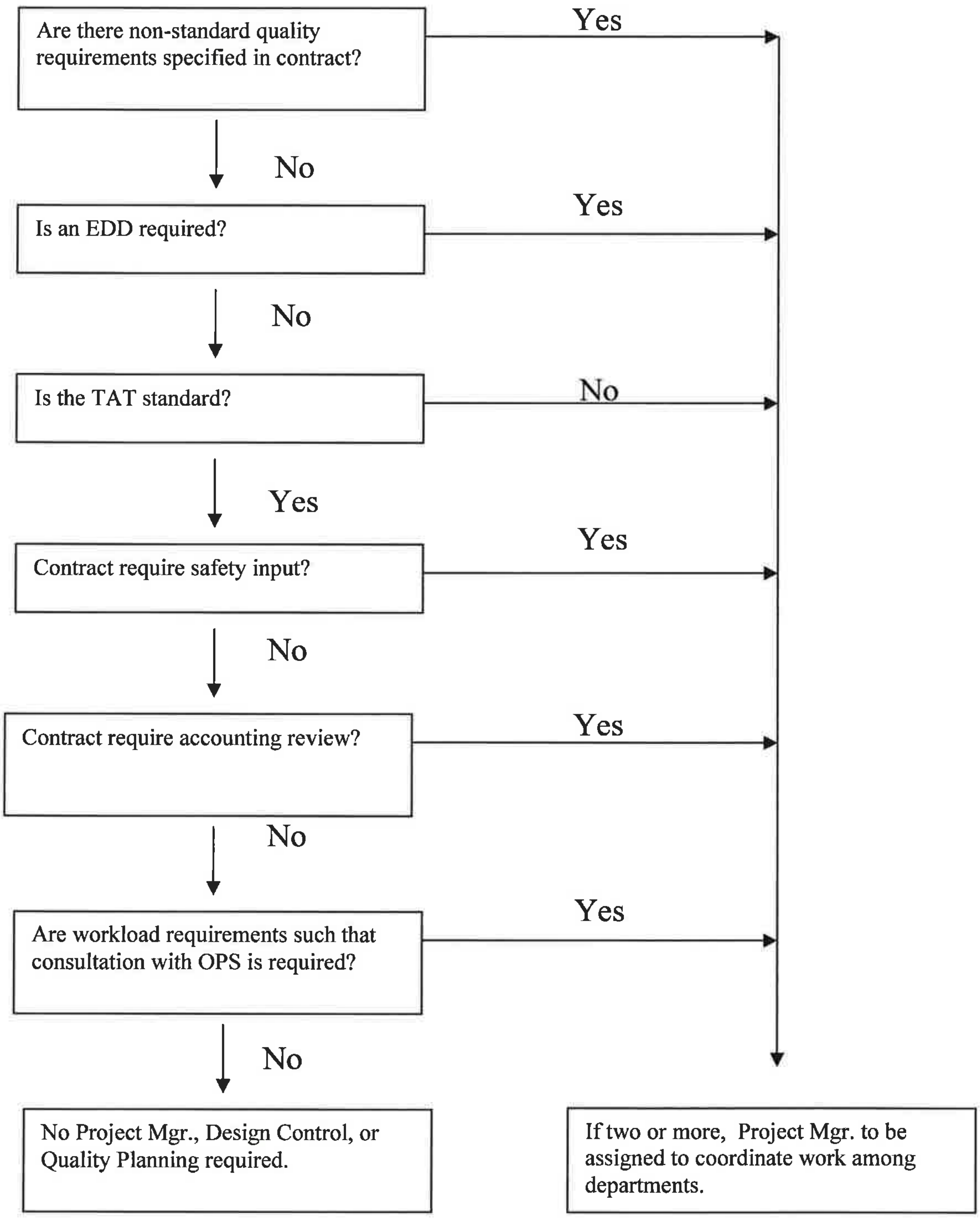


Figure 3-3

Contract Review Checklist

Please review the designated portion of the attached contract/scope of work and determine if your department/work group can or cannot meet all of the requirements of the contract.

Place an X in either the Can or Cannot column, date, and initial where indicated and return this form to the Project Manager within 24 hours of receipt.

Date received: ______________________

Client Company: ______________________

Contact: ______________________

Microseeps PM: ______________________

Date Submitted	Department	Can	*Cannot	Date	Initials
	Operations: • Methods • Personnel • Detection Limits				
	Information Systems • EDD Format				
	Quality Systems • Certifications				
	Accounting • Payment terms				
	Safety • H & S Worksheet				
	Waste • Special requirements				

***Please note on the back of this page the specific reasons why your department may not be able to meet the requirements of the contract.**

4.0 Sample Management

The purpose of this section is to outline and reference procedures for the type and use of sample containers, the preservation of the samples, sample shipping, sample receipt, sample custody, sample log in, sample disposal, and analytical subcontracting. A list of analytical procedures conducted by Microseeps is found in Tables 4-1 through 4-3 at the end of this section. Certifications are found in Table 4-4.

4.1 Sample Containers and Preservation

In order to provide the best possible service for the client and to obtain the required sample volume, Microseeps prefers to provide the sampling containers. Sample containers are constructed of either polyethylene or glass. Containers are purchased that are pre-cleaned and ready for use. Certified clean containers can be provided if project specifications require. Preservatives are added to most sample containers prior to shipping to the client, either by the bottle preparation technician, or the by the vendor. Clients are encouraged to completely fill each container in order to provide adequate sample volume.

For DoD projects: All bottles, reagents, solvents, and supplies used in DoD projects will be verified or certified by the supplier to meet or exceed standard specifications for environmental tests concerned. Verification must be kept on file to qualify each bottle, reagent, solvent and supply.

4.2 Sample Packing and Shipping

Samples are either hand carried to the laboratory or shipped using commercial carriers. Samples should always be shipped to the laboratory daily using a reliable overnight shipping service.

The chain of custody is used to establish the identity of samples and to provide proof of possession of the samples by Microseeps. Chains of custody are supplied to the client with the sample bottle order. The following information should be recorded, by the client, on the chain of custody.

- Client Name, Address, and Phone Number
- Project Name
- Project Number
- Sample identification, Collection Time, Number of Containers
- Specific Analytical Requirements
- Sample Matrix
- To whom the analytical data shall be submitted
- Relinquish signature

Ice should be added so that a temperature of above freezing but ≤ 6°C is maintained during shipment. Samples should be packed inside a large bag and the bag should be sealed. Bags of ice should be placed on top of the bag and should not be in direct contact with the sample containers. Cooler temperatures are taken electronically and recorded upon receipt by the laboratory.

The chain of custody should be enclosed in the zip lock bag provided by Microseeps, and taped to the inside lid of the cooler.

A copy of Microseeps' Sample Acceptance Policy is included with each client bottle order (see below). In order to expedite the sample log in process, please be sure to include and accurately complete all paperwork that should accompany samples to the laboratory.

Sample Acceptance Policy

1. Samples that are shipped to Microseeps must be accompanied by proper, full, and complete documentation. This documentation shall be marked on a chain of custody and shall include: sample identification, the location, date and time of collection, sampler's name, preservation type, sample type, specific parameters to be analyzed, and any special remarks concerning the sample.

2. Sample labels shall be supplied by Microseeps or the client. Those labels must be water resistant and completed using indelible ink. Each sample label must include a unique identification number that links it to the chain of custody documentation.

3. Samples shall be in the proper containers with the preservatives that are specific to the type of analysis required.

4. All samples must be received within specified holding times. Clients are requested to notify a Microseeps' Customer Service Representative if samples with short holding times are being shipped.

5. Samples must arrive at Microseeps with sufficient volume to conduct the requested analyses. All bottles should be filled completely.

6. When problems with samples or documentation are found during the sample receiving process, a Non-Conformance Form is completed by the Sample Custodian and forwarded to the Customer Service Office. A Customer Service Representative will make every attempt to contact the client as soon as possible to make decisions concerning those discrepancies. The Non-Conformance Form is kept as a permanent part of the project file.

7. If the client cannot be reached, a message will be left either on voice mail, or with a receptionist, or via email for the client to return the phone call. The samples will be placed in a storage refrigerator and held until a Microseeps' Customer Service Representative gets a response from the client. (Exceptions will be made when samples are received that have short holding times and the samples are from a client with whom Microseeps has regular and frequent dealings. Or when the samples have short holding times and the samples are from a client with whom Microseeps has a signed contract, work order, or purchase order.)

4.3 Sample Custody

Microseeps takes custody of the samples when they are received at the laboratory or picked up at a client site by a Microseeps' employee. All samples are maintained in access-controlled areas until work is started. The person responsible for either the sample preparation or analysis will retrieve the sample(s) from the storage area and return them when the function is complete.

4.3.1 Samples Requiring Secure Storage

For samples requiring locked storage and strict custody protocols (e.g. samples as evidence), the samples are locked in a temperature controlled sample storage cooler. When evidentiary samples are to be analyzed, the Sample Custodian initiates a sample tracking record (Figure 4-2), and the analyst signs them out using the complete sample number as generated by the LIMS to identify the samples taken.

After analysis, all remaining sample, sample extracts, or the empty sample container are returned to secure storage, signed back in on the sample tracking record, and placed back in the secure storage area. Entries are made to the form each time a sample is removed and returned to the storage areas. Whenever sample preparations are completed, the sample preparation group adds them to the tracking record. All records of evidentiary samples are maintained until the client authorizes destruction.

4.3.2 Sample Receipt Protocols

The Sample Custodian or designee signs for each shipment and a copy of the shipping documents is retained. Specific sample receipt procedures are addressed in Microseeps Standard Operating Procedure for Sample Receipt (SOP-S2). A brief outline follows:

- Shipment containers are inspected, opened, and monitored for temperature, if applicable.
- Temperature is recorded on the Chain of Custody.
- Shipment containers are unpacked and samples reconciled with the chain of custody.
- Chain of Custody is signed.
- Non-conformances are resolved with the client.
- Samples are logged in to Microseeps LIMS system.

Specific sample log in procedures are outlined in Microseeps Standard Operating Procedure for LIMS Operations (SOP-LIMS01) or HORIZON LIMS (SOP-HORIZON-LIMS-01). Microseeps LIMS assigns a unique internal project number and sequential sample numbers. These numbers are used to track the project through the laboratory. The sample numbers are transferred to each sample container using a computer-generated label. These numbers are documented on the chain of custody form and verified by the sample custodian. The computer generates a cooler receipt form, which is printed and placed in the project file along with the chain of custody and other related documentation.

All documentation relating to the project is maintained in the project file and retained in the laboratory for five years.

4.3.3 Resolution of Non-conformances

Sample receipt non-conformances are resolved according to Microseeps Standard Operation Procedure for Sample Receipt (SOP-S2). In nearly all cases, the client is contacted for the resolution decision and documentation.

Several possibilities may exist for resolving sample receipt problems. All decisions are the client's responsibility. Once a resolution is determined, the solution is noted on the non-conformance form and one or more of the following actions will occur:

- The log-in process will continue
- Written documentation will be requested from the client
- The sample(s) will be returned
- The sample(s) will be disposed

Throughout the problem resolution process, the sample will either be kept in a secure area or will be in view of the sample receipt personnel. All records generated during this process become a part of the client's permanent file.

When a client decides to proceed with analyses of samples that do not meet acceptance criteria, that decision shall be fully documented on the non-conformance form and the analysis data shall be "qualified" using a narrative on the final data report.

4.4 Sample Storage and Recovery

Samples requiring refrigeration are placed into temperature-controlled coolers that are maintained above freezing but ≤ 6°C. The cooler temperature is recorded each morning and afternoon. The walk-in cooler, volatiles storage cooler, and CSIA storage cooler, use a Min/Max thermometer, and are recorded once a day. Temperature logs are maintained for each cooler.

All samples for volatile analysis are segregated in a cooler away from other samples. All samples are stored separately from standards, reagents, food, and other potentially contaminating sources.

4.5 Sample Disposal

Once samples are analyzed, they are moved from a primary to a secondary storage area. Samples are stored in secondary storage areas for thirty days following the date an analytical report is generated. Samples are disposed or returned according to the procedures outlined in SOP-ADM 14, Microseeps Standard Operating Procedure for Waste Disposal.

4.6 Subcontracting Analytical Samples

Microseeps' Laboratory Manager or designee will notify the Project Manager when samples or extracts need to be sent to a subcontract laboratory, the number of samples to be sent, and the duration of the need for subcontract services for services routinely provided at the Microseeps facility. The Project Manager or Customer Service Representative will notify the client in writing of the intent to subcontract samples. The Subcontract Coordinator will schedule the work with the subcontract laboratory and arrange the specifics of shipping the samples.

The Subcontract Coordinator shall monitor the progress of the analytical work and receive the analytical data from the subcontract laboratory.

In the event of expedited turnaround that cannot be met by Microseeps, the Subcontract Coordinator shall initiate the subcontract laboratory procedure in order to meet the client's need.

4.6.1 Subcontract Laboratory Approval

The following procedures are in place to ensure that laboratories that are to be used for subcontracting analytical samples meet minimum requirements for quality as specified by the Quality Systems Department. Prior to approval of a subcontract laboratory, the Quality Systems Department shall request the following information from the laboratory:

- List of current certifications and expiration dates of each.
- Copy of the Quality Assurance Plan for the subcontract facility.

Once this material has been received, it shall be reviewed by the Quality Systems Department and a decision will be made concerning the approval of the subcontract laboratory.

For DoD projects: All subcontracting of DoD projects will be to approved DoD laboratories.

4.6.2 Client Notification of Subcontract Laboratory

There are various reasons why a subcontract laboratory may be used including, but not limited to, an expedited turnaround time, laboratory capacity, and special analysis. All clients shall be notified in writing when any samples are to be sent to a subcontract laboratory.

Where the laboratory subcontracts any part of the testing that is covered under NELAC, this work shall be subcontracted to a NELAC accredited laboratory. The laboratory performing the subcontracted work is indicated on the final report and non-NELAC accredited work is clearly identified.

TABLE 4-1

Container, Preservation, and Holding Time Requirements (EPA Methods for Chemical Analysis of Water and Wastes Table I and SW-846 3rd ed. Revision 4, Tables 2-40A, 2-40B)

Parameter	Method	Container (1)	Preservative (2)(3)	Maximum Holding Time (4)
Alkalinity	SM2320B	P	Cool to above freezing but $\leq 6^{o}C$	14 days
Anions by IC	SW846-9056	G, VOA with TLS	Cool to above freezing but $\leq 6^{o}C$	48 hours for NO_2, NO_3 28 days for other anions
TOC/DOC	SW846-9060 SM 5310 C	G	Cool to above freezing but $\leq 6^{o}C$, H_2SO_4 to pH< 2	28 days
pH	SM 4500 H+ SW846-9040	P	Cool to above freezing but $\leq 6^{o}C$	Immediate
Sulfide	SM4500 S-F	P	Cool to above freezing but $\leq 6^{o}C$; Zinc Acetate & NaOH to pH>9	7 days
Purgeable Halocarbons	SW846-5030 8260B EPA 624	G with TLS	HCl to pH<2, Cool to above freezing but $\leq 6^{o}C$	14 days
Purgeable Aromatics	SW846-5030 8260B EPA 624	G with TLS	HCl to pH<2, Cool to above freezing but $\leq 6^{o}C$	14 days

1. AG - amber glass, G - glass, P - polyethylene, TLC - Teflon-lined cap, TLS - Teflon-lined septum
2. Sample preservation should be performed immediately upon sample collection. Composite samples may be preserved by maintaining at $\leq 6^{o}C$ until sample splitting and collection is completed.
3. If the dissolved content is to be measured, samples should be filtered on site immediately before adding preservatives.
4. The holding times listed are the maximum times that samples may be held before analysis and still be considered valid under EPA regulations. Holding times are measured from sampling.

TABLE 4-2

Container, Preservation and Holding Time Requirements for Soil, Sediment, Sludge

Parameter	Method	Container[1]	Preservative	Maximum Holding Time
Volatiles	SW846-5035 8260B	G with TLC Encore	Cool to above freezing but ≤6°C MeOH & $Na(SO_4)_2$	14 days
Percent Solids	SM2540F	G with TLC	Cool to above freezing but ≤6°C	7 days
pH 1:1	SW846-9045C	G with TLC	Cool to above freezing but ≤6°C	Immediate

1. TLC = Teflon-lined cap, G = Glass

Table 4-3

Bioremediation Indicator Parameters and Risk Analysis Test Methods
These parameters are analyzed using Microseeps' Methods.

Parameter	Method	Container	Preservative	Maximum Holding Time
Hydrogen by Bubble Strip	SM9/AM20Gax	22 cc vapor vial with stopper septum	None	14 days
Light hydrocarbons by Bubble Strip	SM9/AM20Gax	22 cc vapor vial with stopper septum	None	14 days
Permanent gases by Bubble Strip	SM9/AM20Gax	22 cc vapor vial with stopper septum	None	14 days
Light hydrocarbons in water: Methane, Ethane Ethene	PM01/AM20Gax RSK-175	40 ml Amber VOA vial with mylar septum	Trisodium Phosphate or Benzalkonium Chloride & Cool to above freezing but ≤6°C	14 days
Permanent gases in water: Oxygen, Nitrogen, Carbon Dioxide	PM01/AM20Gax	40 ml Amber VOA vial with mylar septum	Benzalkonium Chloride & Cool to above freezing but ≤6°C	14 days
Light hydrocarbons in vapor	AM20Gax	22 cc vapor vial with flat septum	None	14 days
Permanent gases in vapor	AM20Gax	22 cc vapor vial with flat septum	None	14 days
Hydrocarbons in vapor	AM4.02	22 cc vapor vial with flat septum	None	Unspecified
Chlorinated hydrocarbons in vapor	AM4.02	22 cc vapor vial with flat septum	None	Unspecified
Total inorganic carbon in water	PM01/AM20Gax	40 ml Clear VOA vial with mylar septum	Cool to above freezing but ≤6°C	14 days
Volatile Fatty Acids	AM21G	40 ml Clear	Cool to above freezing but ≤6°C	21 days
Low Level VFA	AM23G	40 ml Amber with teflon septum	Cool to above freezing but ≤6°C Benzalkonium chloride	14 days
AMIBA	WC-43	BAFeIII: 8oz plast. All by direct push: 2 oz glass soil jar All by drill. rig: 2 – 40 ml amber 2 oz glass soil jar	Freeze	3 months

Table 4-4

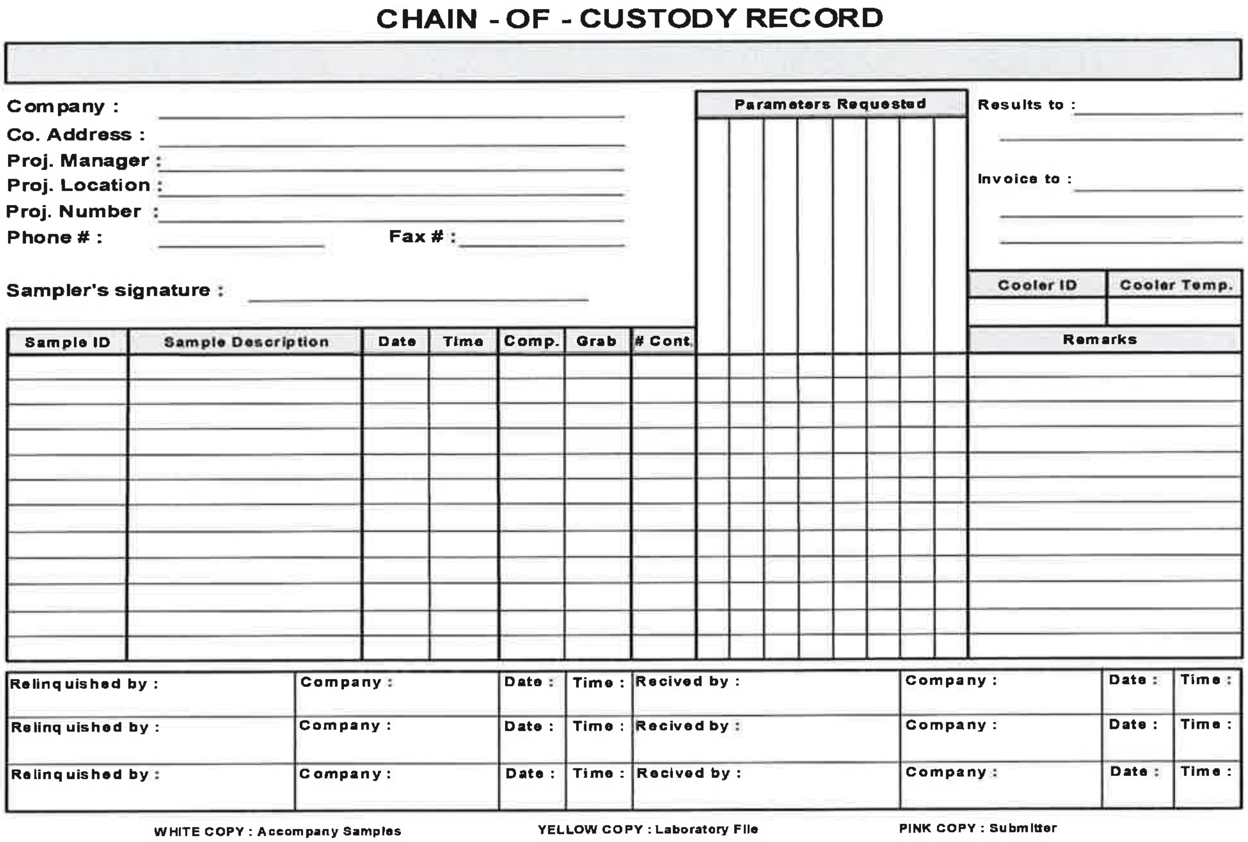
NELAC Accredited Parameters/Methods

Primary NELAC: Pennsylvania
Secondary NELAC: FL, NY, NJ, NH, VA, CT, SC, LA, TX
(Not all states accredit all parameters.)

Parameter	**Method**
Alkalinity	SM2320B
Chloride	SW846-9056
Nitrate	SW846-9056
Nitrite	SW846-9056
Sulfate	SW846-9056
Sulfide	SM 4500S-F
TOC	SW846-9060, SM 5310C
Volatile Organics	SW846-8260B, EPA 624
pH	SW 9040, SM 4500H+
Light Hydrocarbons	RSK175
Dissolve gases & Light Hydrocarbons	Microseeps SOP-AM20GAX
Hydrogen	Microseeps SOP-AM20GAX
Total Inorganic Carbon	Microseeps SOP-AM20GAX
Volatile Organics in Vapor	Microseeps SOP-AM 4.02
Volatile Fatty Acids	Microseeps SOP-AM23G, Microseeps SOP- AM21G
Fuel Oxygenates	SW846-8260, Mod. 524.2

Call Customer Service Office for state-specific analyte list.

Figure 4-1
Chain of Custody Form



CHAIN - OF - CUSTODY RECORD

Company :
Co. Address :
Proj. Manager :
Proj. Location :
Proj. Number :
Phone # : Fax # :

Sampler's signature :

Results to :

Invoice to :

Cooler ID	Cooler Temp.

Sample ID	Sample Description	Date	Time	Comp.	Grab	# Cont.	Parameters Requested								Remarks

Relinquished by :	Company :	Date :	Time :	Recived by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Recived by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Recived by :	Company :	Date :	Time :

WHITE COPY : Accompany Samples YELLOW COPY : Laboratory File PINK COPY : Submitter

Figure 4-2

Sample Tracking Record

Client Name: ______________________ **Page** _____ **of** ______

Client Project Number: ______________________

Bottle Type **Circle or Highlight** (Sample Receiving Only)	Phenol	Sulfide	Nutrient	TIC	VFA	Oxygenates	D - Metals
	G. Chem.	Coliform	Semi-VOA	Soils	LLVFA	HEM	
	TOC/DOC	Cations	VOA	Diss. Gas	Hydrogen	SGT-HEM	
	Cyanide	Anions	TPH	Vapor	AMIBA	T - Metals	

Sample Receiving only to mark above dotted line

Sample Numbers	**Removed from Storage**			**Bottle Type**	**Returned or Placed in Storage**		
	By	**Date**	**Time**		**By**	**Date**	**Time**

Enter Bottle Type From List Above In Proper Column

5.0 Facilities, Instrumentation, and Materials Procurement

5.1 Facility Description

Microseeps is located in the University of Pittsburgh's Applied Research Center (UPARC). The complex consists of 58 separate buildings, which house over 120 companies. The Oxford Development Company provides management for the UPARC facility including building maintenance and safety support. Oxford Development's maintenance personnel are on-site and respond quickly and efficiently to all internal environmental or air quality issues. Specialized maintenance staff is on-call to respond to ventilation, heating, cooling, lighting, or other problems that may occur.

Laboratory temperatures are controlled by the permanent heating and air-conditioning systems in the UPARC complex. Where the cooling systems have not been efficient enough to maintain correct temperature and humidity requirements for proper instrument function, Microseeps has installed additional units as needed.

When environmental conditions jeopardize the results of environmental tests, the analyst shall notify the Laboratory Manager immediately of the problem. If the problem cannot be resolved immediately the Laboratory Manager shall order a stoppage of all work until either the problem is resolved, or another area of the laboratory can be utilized to continue testing.

Microseeps is located in Building B-1 and has offices and laboratories on the first, second, and fourth floors.

5.1.2 Laboratory Areas

The following table specifies the locations of the individual laboratories and workspaces in the building in which Microseeps is housed.

First Floor

• Bottle Preparation	Room 108
• Sample Receiving	Room 115/117
• Volatiles Laboratory	Room 126/128
• Wet Chemistry	Room 127

Second Floor

• Dissolved Gas Laboratory	Room 220/222
• Vapor Laboratory	Room 221
• Instrument Laboratory	Room 213
• LIMS Center	Room 218

Fourth Floor

• CSIA Laboratory	Room 424/428/128

5.1.3 Building and Laboratory Security

Employee access into the UPARC complex is controlled through key-card turn-styles where each individual that works in the complex has a unique code for entry. UPARC Security is aware of who is on-site or off-site at any given time. Microseeps' laboratory areas are controlled through keyed entry to prevent employees from other firms housed in the complex from gaining access to Microseeps' laboratories. Each employee is issued a key that will open doors to rooms occupied by Microseeps. Those keys do not access accounting or CEO offices. During normal working hours, the laboratory areas are kept unlocked. After normal business hours the rooms are locked to prevent unauthorized personnel entry.

A UPARC Security Force monitors the facility twenty-four hours a day with a series of video cameras. The guards also make rounds by foot and vehicle during afternoon and night shifts. Visitors cannot gain access to the complex except through the Main Security Gate. All visitors are required to register at the main gate and obtain a visitor's pass before entering the complex. UPARC Security notifies Microseeps upon the visitor's arrival to verify admittance. Visitors are directed to Microseeps Reception Office. The visitor is then escorted, by a Microseeps' employee to the Microseeps' front office to sign the visitors log, and is then directed to the employee or laboratory they intend to visit.

5.2 Instrumentation

Instrumentation must be properly calibrated and maintained to produce reliable and reproducible results. This section of the Quality Systems manual defines minimally acceptable standards for installation, calibration, and maintenance of analytical instruments used in the laboratory. Fully detailed procedures are instrument specific and are available in the individual instruments' Operator Manuals.

A list of Microseeps' Instrumentation is included in Exhibit 5-1. This list is updated whenever equipment is placed in service or removed from service.

5.2.1 Installation and Set-up

All new instrumentation must be included in the Quality Systems program prior to being used for sample analysis. When new equipment is ordered, the Laboratory Manager and the Instrumentation Specialist determine the preparations that the laboratory must make to accommodate the equipment. This plan includes descriptions of facility modifications that may be required, personnel responsible for installation (manufacturer or Microseeps employee), performance criteria that need to be met, and training procedures that will be followed.

Data generated during installation and set-up will be included in the maintenance log for the instrument. This data may become important later for troubleshooting and diagnostic checks. Operator manuals supplied by the manufacturer are maintained in the laboratory for reference.

5.2.2 Calibration

Calibration procedures for instrumentation are thoroughly documented and routinely followed to provide assurance that the data produced are reliable and accurate. Specific calibration procedures and frequency are detailed in the individual Standard Operating Procedures.

Initial calibration involves comparing instrumental response to various concentration levels of the analytes of interest. The calibration curve will contain a minimum of five points (or better), excluding a blank. The lowest point of the curve should be equal to or lower than the reporting limit. The most concentrated standard should be below but near the upper concentration limit of the linear range. All standards are prepared from solutions of certified concentrations. All calibrations are checked against a "second source" obtained from, preferably a different vendor, but at least a different lot. All calibrations are followed by an initial calibration blank to verify that system contaminants and carry-over are not present. For organic analyses, surrogates are added to each blank and standard. In addition, internal standards are also added for some organic analyses.

If the initial instrument calibration results are outside established acceptance criteria, corrective actions are performed. These criteria and the corrective action are specified in individual Standard Operating Procedures. Data associated with unacceptable initial instrument calibration is not reported.

5.2.2.1 Calibration Verification

If an initial instrument calibration is not performed on the day of analysis, the validity of the initial calibration is verified prior to sample analysis by running continuing instrument calibration verification standards with each analytical batch. Continuing instrument calibration verifications must be run at the beginning and end of each analytical batch.

5.2.3 Instrument Maintenance

Maintenance of analytical instruments is carried out under the direction of the Instrumentation Specialist and may include regularly scheduled preventive maintenance, or maintenance on an as-needed basis due to instrument malfunction. Maintenance activities for instrumentation are documented in Instrument Maintenance Logs. This documentation becomes a part of the laboratory's permanent records.

Regular maintenance of support equipment, such as balances, thermometers, and fume hoods is conducted annually and more often if required. Maintenance on other support equipment, such as ovens and refrigerators is conducted on an as needed basis. The analysts are responsible for ensuring that temperatures of ovens and refrigerators are checked and recorded twice daily. The

Laboratory Manager is notified if the temperature is outside of the range of use of the specific piece of support equipment, and the equipment is scheduled for maintenance.

Records of maintenance to support equipment are also documented in Maintenance Logbooks. Each piece of support equipment does not necessarily have it's own logbook. Maintenance logbooks may be shared with equipment that is housed in the same laboratory area.

5.2.3.1 Out of Service Instruments

In the event that an instrument cannot be calibrated or is determined to be out of order, an out of service or out of calibration tag is placed on it. The analyst is responsible for ensuring the equipment is tagged. This tag shall be removed when the instrument is repaired and ready for use.

5.2.3.2 Instrument Repair

Unexpected repairs resulting from instrument failure are scheduled immediately after the malfunction is observed. Instrument failures are detected through direct observations and by evaluation of the response of verification standards throughout the analytical run. The Instrumentation Specialist is responsible for deciding if laboratory personnel can make the repair or if an outside contractor is required.

Data obtained during instrument failure are not entered into the LIMS for reporting to the client. Complete records of the repairs are maintained in the Instrument Maintenance Logbooks. These records may include notes taken by laboratory personnel during repair and a copy of the service call record. Acceptable instrument performance must be verified before samples can be analyzed.

5.3 Materials Procurement

The purpose of this section is to define requirements for the procurement of materials needed to support laboratory operations.

5.3.1 Purchase of Laboratory materials/Supplies

The laboratory shall purchase necessary supplies by recognizing that all items used in the performance and successful completion of an accurate analysis fall into two categories:

1. **Hardware and Associated Durable Equipment**

These laboratory materials would be those associated to the physical components needed to successfully operate the appropriate analyzer for any given test or set of tests. Theses materials, more often than not, will be purchased directly from the manufacturer of the analyzer. In such cases where vital materials have been discontinued or become available from an alternate source, the laboratory may purchase such items from other vendors. The providers of such materials will not be evaluated by any documented procedure or collection of associated quality documents. All materials required in this category must first be approved by the Laboratory Manger(s), Technical

Director or Instrumentation Specialist. Ultimately the successful completion of accurate testing, around the requirements of each individual analytical Standard Operating Procedure, shall determine each vendor's acceptance in this category.

2. Reference Materials and Consumable Laboratory Supplies

These laboratory materials would be those associated to the direct determination of unknown target analyte concentrations present in the samples collected and submitted by our customers. These materials can be purchased from a wide variety of suppliers. The laboratory shall maintain a list of acceptable vendors from which these materials can be purchased. Each vendor in this category shall undergo an initial acceptance procedure and annual renewal by the Quality Systems Coordinator. The Procurement Coordinator will ensure that each vendor provide adequate documentation such that the laboratory can assure a level of conformance with industry guidelines. Such documentation could be related to, but not limited to, a vendor's ISO certification or Quality Assurance Plan. All reference materials will be purchased with Certificates of Analysis/Acceptance.

5.3.2 Placing Orders

The purchasing of routine supplies necessary for the completion and accuracy of any given test procedure are initiated by the analysts, as needed. Any non-routine laboratory materials/supplies selected by the analysts should be reviewed and approved by the Laboratory Manager(s), Technical Director, or Instrumentation Specialist, prior to purchase. All purchasing is initiated by completion of the Purchase Order Form. Vendor's name, Item(s) reference number, description of the item, quantity requested, date required, and the accounting category, will be filled out by the individual requesting the supplies. The Purchase Order Form is then delivered to the Procurement Coordinator, where a unique purchase order reference number is assigned to each order. It will be the responsibility of the Procurement Coordinator to purchase such supplies from the acceptable list of vendors, as described in Section 5.3.1. No other vendors shall be used in the purchase of laboratory materials/supplies, without specific approval of the Quality Systems Coordinator.

Note: One exception to this procedure is acceptable. Routine supplies ordered from Thermo Fisher may be placed by those analysts with online access.

5.3.3 Receipt of Materials

Supplies or materials are received by the Sample Custodian, who in turn, calls the employee who the items are for to come pick them up. The employee compares the materials received to the packing list. Any discrepancies are noted on the packing list and is given to the Procurement Coordinator. A call is placed to the vendor to resolve any problems.

Once the order is reconciled with the purchase order, the packing list(s) is attached to the purchase order and is kept on file by the Procurement Coordinator. The materials and associated documentation (i.e. Certificates of Analysis or Purity) are forwarded to the Department that placed the order for storage until use.

All Material Safety Data Sheets are kept in the lab area where the supplies are being used.

Review Date: April 9, 2013

Figure 5-1
Microseeps' Instrument and Equipment List

Volatiles

Hewlett Packard Chemstation Data System with NIST Chemical Structures; Hewlett Packard 6850Series II GC with EPC and 5973 Mass Spectrometer; Varion Archon Autosampler (Serial 14288) and Tekmar Velocity XPT Concentrator (Serial US04159007)

Thermo-Electron Focus GC (Serial 10603036) with DSQ II Mass Spetrometer (Serial MS1100132); Teledyne Aquatek 70 Autosampler (Serial US07003004) and Tekmar Velocity Concentrator (Serial US06335001)

EDONORS

Dionex Ion Chromatograph Model ISC 2000 with Degasser; Gradient Eluent Generator; AS-40 Autosampler, Columns.

Varian 3400 Gas Chromatograph (Serial 10272) with Varian 8100 Autosampler (Serial 1371)

Thermo-Fisher Scientific Ultra Trace GC (Serial 620120045) with TriPlus RSH Liquid Autosampler (Serial 241284)

Risk Analysis

Agilent 6890 Gas Chromatograph (Serial US10347026) with Agilent G1888 Headspace Autosampler (serial IT40220036).

Hewlett Packard 5890 Series A Gas Chromatograph (Serial 2536A05842) with Tekmar 7000 Autosampler (Serial 91099014/91135007)

Hewlett Packard 5890 Series II (Serial 3336A51836) with Tekmar 7000/7050 Autosampler (Serial 91346008/91346016)

Thermo-Fisher Scientific Ultra Trace GC (Serial 620120028) with TriPlus RSH Headspace Autosampler (Serial 237682)

Three Proprietary GCs

GOW MAC Series 580 Gas Chromatograph (Serial 580-200)

Ohaus Discovery Analytical Balance Model # DV215CD (Serial 1128122704)

Wet Chemistry/EACCEPTORS

Dionex ISC 3000 Ion Chromatograph with dual Autosamplers, columns, and ovens with conductivity and UV-VIS detectors

OI Analytical Aurora 1030 TOC Analyzer (Serial J025730751) with Autosampler (Serial E019788198)

Denver Instruments Model SI-4002 Top Loading Balance

Spectronic 20G Colorimeter

Spectronic 20D Colorimeter

Orion 601A pH Meter

Sartorius Model 1612 Analytical Balance

CSIA

Tekmar Aqua Tek 70 Autosampler (Serial US 06151001)

Tekmar Velocity XPT Purge and Trap (Serial US 06191003)

Entech 7100A Pre-concentrator (Serial 1304)

Thermo Trace GC Ultra Gas Chromatograph (Serial 200510408)

Thermo GC-Combustion III Interface (Serial 111201-175)

Thermo GC /TC Reactor OD (Serial 108520-349)

Thermo Delta V Plus Isotope Ratio Mass Spectrometer (Serial 8018)

Thermo-Electron GC (Serial 10603008) with DSQ II Mass Spectrometer (Serial 100442); Varian Archon Autosampler (Serial 14655) and Tekmar Velocity Concentrator (Serial US6047001)

Thermo Delta V Plus isotope ration mass spectrometer

Thermo Conflo IV interface

Thermo GC Isolink interface

Agilent 7890A GC System

Tekmar Aquatek 100 autosampler

Tekmar Stratum Purge and Trap concentrator

Entech 5400 Thermal Transfer System

Entech SL2 Perconcentrator

Agilent 6890N GC (Serial US10226064)

Agilent 5973N MSD (Serial US63810430)

Teledyne Tekmar Aquatek100 Autosampler (Serial US11348004) and Stratum Concentrator (Serial US11327002)

GC/MS Chemstation Datasystem (SN 2UA71516GF)

6.0 Data Quality

6.1 Data Quality Objectives

Microseeps conducts analysis on environmental samples for clients who rely on the data in order to make decisions concerning environmental problems, environmental monitoring, and in many cases to investigate the feasibility of cutting edge remedial technologies. The necessity of high quality data is essential so that the best decisions can be made in the interest of both the environment and the client. Microseeps believes data quality objectives are applied to a project from the initial sampling to the final data validation process. On a laboratory scale, Microseeps' data quality objectives are reflected in individual Technical Standard Operating Procedures as quality control acceptance criteria.

Quality control sample acceptance criteria is generated using one of following three methods:

- A minimum of twenty data points are manually collected and entered into an EXCEL spreadsheet. The average percent recovery and/or relative percent difference (RPD) is calculated, whichever is applicable. Acceptance criteria are generated using the standard deviation of the average percent recovery and RPD. Three standard deviations comprise the acceptance range around the average percent recovery and above the RPD.
- Calculated electronically by the LIMS database and expressed in the Control Chart Program.
- Taken from EPA method-specific recommendations in the absence of laboratory-generated criteria.

Acceptance criteria generated from the implementation of control charts, either manually or LIMS generated are evaluated annually or more often. If it is determined that the acceptance criteria has changed to a broader set of limits, the reason for the change is evaluated for error to ensure the analytical method is still in control. When warranted, corrective action shall be instituted by the Quality Systems office or the Operations Department.

All analytical data including quality control results are checked in accordance with SOP-ADM 16 Standard Operating Procedure for Data Integrity, Review and Validation. Performance Evaluation studies are conducted twice a year and the results are reviewed by management. All failed PE samples are followed up with Corrective Actions.

To maintain the quality of laboratory data and to ensure that laboratory procedures are under control, a variety of internal batch quality control samples are analyzed. The data from those samples are used to calculate statistics that help determine precision, accuracy, and to track potential bias. In addition, performance evaluation studies are conducted regularly as well as random submission of blind quality control samples. Certified reference standards are used, as well, to ensure that quality is maintained.

6.2 Internal Batch Quality Control

Batch quality control sample types and frequencies are recommended in published methods and specified in Microseeps Technical Standard Operating Procedures. In general, a batch of samples consists of twenty samples or fewer (as recommended by analytical methods) that are analyzed at the same time. Typically, a set of internal quality control samples is analyzed once for each batch of clients' samples. The types of internal batch quality control samples are discussed below.

6.2.1 Initial and Continuing Calibration Verification Standards

Initial and continuing calibration standards verify the ratio of instrument response to the analyte amount. Typically, initial calibration verification and continuing calibration standards are made from stock solutions, which are different from the stock used to prepare the initial calibration standards.

6.2.2 Calibration Blank

A calibration blank is a 'clean' sample made from an appropriate matrix and/or solvent. The calibration blank is analyzed to insure that there is no contamination in any part of the analytical system, or to establish a baseline if that "contamination" is expected and known to be of consistent concentration. Calibration blanks are analyzed after each initial, continuing, and calibration verification standard. The analytical result of the blank must be below the laboratory's quantitation limit or project specific requirements in order for analysis to proceed. If the result of the analysis is above the acceptance limit, the source of contamination must be identified and eliminated. The one exception involves the presence of common laboratory solvents as defined by the EPA.

6.2.3 Method (Preparation) Blanks

Method blanks are reagent water or, for solid/waste matrices, sand, or other appropriate material, or an appropriate solvent carried through the entire analytical process to monitor potential contamination that may or may not be introduced during sample preparation and processing. For organic analyses, surrogates and internal standards are added to the method blank.

Method blanks are analyzed at the beginning of the batch and prior to sample analysis. If the analytes of interest are below the laboratory's quantitation limit or project specific limit, sample analysis can proceed. If analyte concentrations are found above the acceptance limits, the source of the contamination must be identified and corrected. The reagents used for sample preparation must be checked for contamination and the samples associated with the method blank must be prepared again and reanalyzed if necessary.

6.2.4 Duplicates

Duplicates are analyzed to assess precision of the analytical procedure. Samples for batch duplicate analyses are selected at random, ensuring that the selection is rotated among client samples so that various matrix problems may be noted and/or addressed. If the sample requires that an aliquot be removed and placed in another container in order to conduct the duplicate analysis, a representative aliquot is collected using one of the following options discussed below in Subsection 6.3.4.

Precision of the analyses may vary due to the matrix effects of the sample. If the precision is outside established control limits, the duplicate analysis is repeated. If the precision is still outside established control limits and all other quality control checks are within control, a matrix effect is assumed.

6.2.5 Matrix Spike/Matrix Spike Duplicates

Matrix spike and spike duplicate samples are analyzed to determine the extent of matrix bias or matrix interference on analyte recovery and to determine sample-to-sample precision. Analytes stipulated by the method, by regulations, or by other requirements must be spiked into the sample. If not supplied by the client, the analyst may choose these samples at random. Percent recoveries are calculated for each of the analytes detected. The relative percent difference between the samples is calculated and used to assess analytical precision.

Recovery data is highly dependent upon matrix effects. If acceptable recoveries are observed, it is determined that matrix is having no significant affect on the analytical procedure and that sample preparation and analysis have been performed correctly. Whenever precision, calibration, and system quality control checks are acceptable, large or small matrix spike recoveries are attributed to matrix effects. Because samples are spiked prior to analysis, the concentration of the analyte of interest in the sample may be so high that the spike amount is insignificant. In these cases, spike recovery is meaningless and is not calculated.

6.2.6 Laboratory Control Samples

Laboratory control samples are samples that are spiked with a specific concentration of known reference materials, independent of the calibration standards that are carried through the entire analytical process. These standards are used to assess the accuracy of the analytical process. Where possible, acceptance limits are statistically based upon actual laboratory data. If results are outside acceptance limits, corrective action must be performed before sample analyses can proceed.

6.2.7 Surrogate Standards

Surrogates are organic compounds which are similar to analytes of interest in chemical composition, extraction, and chromatography, but which are not normally found in environmental samples. These compounds are spiked into all blanks, standards, samples and spiked samples prior to organic analysis.

If surrogate recovery is not within acceptance limits, corrective action is instituted and reanalysis of those samples occurs.

6.2.8 Insufficient Sample Volume

When there is insufficient client sample volume in a batch to conduct quality control samples for precision, then a laboratory control sample and laboratory control sample duplicate are analyzed.

6.3 Measurements of Data Quality

Data quality measurements vary from parameter to parameter, are represented as warning and control limits, and are displayed along with associated data on control charts. The following types of measurements are utilized by Microseeps to insure the highest quality data is being provided.

6.3.1 Precision

Precision is a measure of the degree of mutual agreement among individual measurements made under prescribed conditions. Precision of laboratory data is determined through duplicate analyses of samples or matrix spikes and spike duplicates, and is calculated for Microseeps purposes, as either the range or relative percent difference (RPD) of the measurements.

6.3.1.1 Range

Range is defined as the difference between the highest and the lowest value reported for a sample. Range is used in the laboratory as recommended in published regulatory methods. The formula for calculating range is as follows:

$$Range = HighestValue - LowestValue$$

6.3.1.2 Relative Percent Difference

Relative percent difference (RPD) is used for all of the analytical methods at the laboratory where sample duplicates are analyzed and where both matrix spikes and matrix spike duplicates are analyzed. If one or both measurements are less than the reporting limit, precision is not calculated. The formula for calculating relative percent difference is as follows:

$$RPD = \frac{|A - B|}{\frac{A + B}{2}} \times 100\%$$

6.3.2 Accuracy

Accuracy is the measurement of agreement between a measurement and the true value. It is calculated as the percent recovery of standards and spikes. Accuracy is calculated as the percent recovery of laboratory control samples, matrix spikes, and in organic chemistry surrogate recoveries.

6.3.2.1 Percent Recovery

Percent recovery is used for all of the analytical methods at the laboratory where laboratory control samples, matrix spikes, and/or surrogates are analyzed. The formula for calculating percent recovery is as follows:

$$\%\mathrm{Recovery} = \frac{Measurement}{True\,Value} \times 100\%$$

6.3.3 Bias

Bias is defined as a systematic error due to the experimental method that causes the measured values to deviate from the true value. Bias is determined by plotting the average percent recovery and the average relative percent difference on a control chart. A bias is suspected when seven successive data points are plotted on the same side of the average. This is considered an out of control event.

6.3.4 Representativeness

Representativeness is defined as data that accurately and precisely reflect the sampling points or environmental conditions. Numerous items throughout sampling and sample handling must be controlled to maximize representativeness. These include sample collection, preservation, and holding times. Since Microseeps does not perform sample collection, Microseeps cannot accept responsibility for representativeness of sample collection.

When an aliquot must be removed from the sample container for analysis or for making batch quality control samples, one of the following two options are used in order to obtain a representative aliquot:

1) If the analysis won't be compromised by agitation, then the sample is stirred, mixed, crushed, blended, as needed, and the aliquot is removed from sample container and placed in another container.

2) If the analysis may be compromised by shaking or mixing the sample, then portions of the aliquot are taken from different places within the original sample container ensuring that the aliquot is as representative as possible of the original sample.

In some cases where a sample cannot be homogenized, the client will be contacted and a course of action will be decided upon according to a mutually agreed upon decision.

6.3.5 Comparability

Comparability is the confidence level with which one set of data can be compared to a related set of data. Microseeps uses EPA recommended methodology, whenever feasible, participates in internal and external performance evaluation programs, and uses standard reference materials for sample analysis as means of enhancing comparability.

6.4 Validation of Methods

Validation is the confirmation by examination and the provision of objective evidence that the particular requirements for a specific intended use are fulfilled.

Microseeps validates non standard and laboratory-designed/developed methods, standard methods used outside their intended scope, and amplifications and modifications of standard methods to confirm that the methods are fit for the intended use. The laboratory keep records of results obtained, the procedures used, and a statement that the method is fit for the intended use.

As requests come in they are reviewed to see if they can be satisfied by the standard methods or by our own internally developed nonstandard methods. If the answer is no, a brief search is done for appropriate laboratories and the Technical Director reviews the results to see if a.) any laboratories that have been found can properly fill the clients request, b.) if there is justification for Microseeps to develop and market an analysis that can fulfill the request. When an analysis is developed, a calibration must be completed along with preparation of an SOP, complete training including an IDOP and a full MDL study. All of these are documented and the records are retained.

6.5 Uncertainty

There are so many sources of uncertainty in a concentration measurement. Certainly, the collection of the sample is a very large source of uncertainty. The particular technique of collection is another, and the location of the points chosen for sampling is a third. Of course, there is uncertainty in analytical measurements as well, and all laboratory analytical procedures are specifically designed to minimize or otherwise control that uncertainty. As such, analytical uncertainty is very likely a minor contribution to the overall uncertainty of any measurement. However, analytical uncertainty is important. There are many potential causes. Some of the most common are enumerated below, along with a brief discussion on how Microseeps minimizes the effect of each:

- Human factors- by maintaining SOPs which are analysis-not analyst-dependant, and by engaging in training and yearly CDOP's, Microseeps tries to minimize the analyst-to-analyst variable.
- Accommodations and environmental conditions-Perhaps the biggest variable here is ambient temperature. In our wet chemistry, and one of our non-traditional laboratories, there is manually controlled heating and cooling. In one of our non-traditional analyses rooms there is additional, automated cooling. Since volatiles

are extremely temperature sensitive, both our volatiles analysis laboratory and our CSIA laboratory are furnished with large capacity air conditioning systems.

- Environmental test calibration and method validation-The vast majority of our analytical activities are specifically designed to address these issues. Specifically, it should be pointed out that all of our tests are calibrated with externally certified standards, and then double-checked with a "second source" standard when possible. Additionally, since we utilize many of our own analytical tests, we have strong emphasis on method validation. For a method to be validated here, it must either pass a successful calibration and then be verified against an external source. The method must be successfully brought through an IDOP and then regularly produce valid matrix spike, matrix spike duplicate and sample duplicate analyses, if applicable.
- Equipment-Before a new piece of equipment is routinely used, an IDOP must be successfully completed using that equipment. This minimizes the potential for un-controlled equipment fluctuations.
- Measurement traceability-If an analytical system is internally calibrated, we maintain records of that calibration, including the certificate of analysis of the standards used in that calibration. If the system was externally calibrated, the records of that external calibration are also supplied.

Finally, to measure the total analytical uncertainty we routinely perform LCS's. (LCS's are chosen because they are submitted to the entire analytical procedure.) The typical acceptance range for an LCS recovery is 80-120%, but the LCS performed with a batch and the SOP for the particular measurement technique should be consulted for specifics.

Review Date: April 9, 2013

7.0 Data Handling

Microseeps maintains records that enable the re-creation of the specific conditions under which data are produced, and method specific Standard Operating Procedures outline procedures for data collection, reduction, validation, and reporting. This section discusses, in general, Microseeps data handling procedures.

On occasion when a client requests analyses that Microseeps is not equipped to perform, capacity issues prevent the laboratory from meeting requested turnarounds, or in the event of an instrument failure, a subcontract laboratory may be used. A list of routinely utilized subcontract laboratories is presented in Exhibit 1 at the end of this section. There may be times when an emergency situation occurs or a client may request the use of a subcontractor not currently listed on Exhibit 1. When those situations occur, the name of the subcontractor will be added during the next annual review for all recurring projects.

For cases when the client requests analyses that Microseeps is unable to perform, the Project Manager notifies Subcontract Coordinator of the need to locate a subcontract lab. The Subcontract Coordinator is responsible for contacting potential subcontract laboratories to determine where the samples will be sent. For routinely requested analyses, standard agreements are in place with the subcontractor. Whenever applicable, subcontract laboratories will be NELAC-approved. Other factors that affect the decision include turnaround, cost, and ability to provide the required data deliverables. Once the decision is made, the Subcontract Coordinator notifies the Project Manager so that the client can be informed. For cases when the internal problems require the use of a subcontractor, the Laboratory Manager will notify the Project Managers of the situation, what samples are affected, and the proposed resolution. The Project Managers will then contact each affected client to obtain approval prior to samples being shipped to the subcontractor.

All samples that require subcontracted analyses are prepared for shipment by the Subcontract Coordinator. A chain of custody is prepared detailing the sample identification, collection date and time, as available, requested analyses, requested due date, and any other special instructions pertinent to the sample shipment. The samples are packed in a cooler with sufficient ice to maintain the appropriate temperature during shipment. All samples for subcontracted analyses are shipped so that the samples arrive the next business day.

All data received from the subcontract laboratory follow the same guidelines detailed in this section, with the Laboratory Manager filling the analyst's role and review performed by the Natural Attenuation Product Services Manager.

7.1 Data Collection

All laboratory employees are responsible for maintaining laboratory records and documenting them in sufficient detail to recreate analyses. Manually entered data are made using permanent ink. Corrections are indicated by drawing a single line through the incorrect entry, dating and initialing the correction, and coding the reason for the correction. The use of correction fluid or tape, erasure, or other means of making corrections is prohibited. The following information is recorded at the bench either manually or printed out via the data system interfaced with the analytical instrument.

- Method performed.
- Analysis date.
- Analysis time.
- Analyst signature or initials on computer printouts.
- Instrument Identification and settings.
- Analytical sequence consisting of a chronological listing of the processing for each standard, quality control check, and sample recorded in an analytical sequence, run log, or data sheet.
- The laboratory sample number.
- Quality control sample type.
- Standard identification and volume used for all calibration standards.
- True value and lot number of all spiked quality control samples.
- Dilutions including actual initial and final volumes.
- Sample aliquot and final volume.
- Instrument reading.
- Final results with units.
- Calculations for all quality control checks.
- Narrative describing any unusual observances.

If an analysis extends over more than one shift or day, each person responsible for part of the analysis records the date and time their portion of the analysis was initiated.

7.2 Data Reduction

Reducing raw data into a presentable form is the responsibility of the analyst performing the determination. The actual equations used to calculate final results are found in the analytical methods. The following general rounding rules are used for the calculations:

- Data is not rounded until the final answer is obtained.
- To round a figure, the number of significant figures is determined. If the figure to the right of the immediate right-most significant figure is greater than 5, round up. If this figure is less than 5, truncate the result after the last reportable figure. If this figure is equal to 5 and there are non-zero digits to the right, round up. If the figure is equal to 5 and there are no non-zero digits to the right, round up when the preceding figure is odd, and truncate when the preceding figure is even.

7.3 Data Validation

Each analyst initials and dates the data that is generated in the laboratory. All data generated by the laboratory undergoes either an independent peer review or a review by a lead analyst or other designated individual to ensure compliance with accepted quality control standards prior to data entry. The purpose of this review is to check for precision, accuracy, and completeness. The following items are verified during this review. Not all items are applicable to each test.

- Holding times.
- Proper measurement units.
- Instrument tune and initial calibration criteria.
- Proper number of calibration standards and blanks.
- Surrogate and spike percent recoveries.
- Comparison of quality control sample results to acceptance criteria.
- Corrective action for out of control conditions.

After this review, all data that is not instrument-interfaced directly with the Laboratory Information Management System (LIMS), is manually entered into the database. All manually entered data undergoes a review upon entry. The Laboratory Director attempts to review approximately 10% of all laboratory data. Either the Quality Systems Manager or his designee will review 10% of all DoD data packages. This review is part of the oversight program and does not have to be completed in “real time.” Project Managers complete the data validation process by reviewing final reports for completeness prior to submission to the client.

7.4 Laboratory Information Management System/HORIZON

The laboratory currently operates and maintains two LIMS systems. These systems are the point of collection for all of the laboratory data. The integrity of laboratory data is of the utmost importance. These systems have built-in security levels that keep individual access on an "as needed" basis and does not allow for access beyond what is necessary for the completion of individual duties. Specific operation and management of the LIMS systems is outlined in the LIMS Standard Operating Procedures that are maintained by the Laboratory.

7.5 Report Preparation

7.5.1 Microseeps LIMS

After all of the data has been entered into the LIMS, a draft copy of the final report is generated and the following items are reviewed by the Laboratory Manager or designee:

- Client name and address.
- Analytical results, units, and reportable figures.
- Appropriate data qualifiers are applied as required according to the following table.
- Inter-parametric relationships.
- Data reasonableness in respect to sample information.

Data Qualifiers

Qualifier	Description
J	Estimated value-result is >MDL but <PQL
U	Component was analyzed for but not detected
R	Surrogate recoveries are outside control limits
M	Percent recoveries or RPD outside of control limits for MS/MSD, sample/dup analyses
B	Component was detected in blank
L	Analyses were performed by a subcontract lab
N	NELAC certified analyses

Following the review, if results are acceptable the Laboratory Manager, or designee makes the determination to generate a final report. The report is forwarded to a Project Manager who conducts a general review for completeness, signs the report, and releases it to the client. The draft copy and a signed final copy of the report is placed in the client file for storage.

Final Reports are sent to clients through the U.S. Postal Service unless the client requests an electronic copy. Electronic copies are placed into Portable Document Format (pdf) or EXCEL spreadsheets and password protected prior to transmission.

7.5.2 Horizon LIMS

After all of the data has been entered into the LIMS, a draft copy of the final report is generated and the following items are reviewed by the Laboratory Manager or their designee:

- Client name and address.
- Analytical results, units, and reportable figures.
- Appropriate data qualifiers are applied as required according to the following table.
- Inter-parametric relationships.
- Data reasonableness in respect to sample information.

Data Qualifiers

Qualifier	Description
J	Estimated value-result is >MDL but <PQL
U	Component was analyzed for but not detected
G*	Analyses were performed by subcontract lab

* each available sub-lab has a specific designation, this qualifier will vary between individual laboratories.

Following the review, if results are acceptable the Laboratory Manager, or designee makes the determination to generate a final report. The final report is electronically stamped with the assigned Project Manager's signature and printed. The report is forwarded to the Project Manager who conducts a general review for completeness and releases it to the client. The draft copy and signed final copy are electronically stored for future reference.

7.6 Final Report Modifications

Once a laboratory final report is generated and sent to the client, it can be modified under the following circumstances, depending on which LIMS processed the clients project:

- An electronic or hard copy of the original unedited report is kept on file in the laboratory. In the case of electronic records and/or files, either a pdf is generated of the original report prior to the editing, or a paper copy of the original report is placed in the project file.
- The reissued report must have a statement in the comments section that specifies the modification(s) and indicates the date of report reissue.
- An electronic or hard copy of the reissued report is retained for future reference and stored with the original report.

Data review of report modifications is conducted in accordance with Microseeps Standard Operating Procedure for Data Review and Validation (SOP-ADM 16).

7.7 Record Retention

A signature record of all employees is maintained in the Training Records Manual kept in the Quality Systems Coordinator's Office.

All raw data and reports for analytical projects are kept for a full five (5) years. After this time the records are destroyed. A Record Release Checklist is posted in the storage area. A destruction date will be recorded on that form when a particular years' records are destroyed. Records are kept onsite in a locked storage area and maintained in accordance with Microseeps Standard Operating Procedure for Document Control (SOP-ADM 05). The area is inspected monthly.

The LIMS database, which retains all electronic records that have been entered from the date of the LIMS inception, is backed up each day. The tape on which this backup is stored is maintained in a secure location off-site.

All critical data on personal computers is backed up on the internal network S drive. The network is backed up on tape and stored at a secure location off-site.

7.8 Service to the Client and Confidentiality

Clients are welcome to an on-site visit to Microseeps Laboratories in order to discuss client needs or requests, and also to monitor the laboratory's performance in relation to ongoing client projects. All efforts are made to maintain client confidentiality while providing service to other clients.

All client data, whether from privately owned or government organizations, and all correspondence is considered confidential information and shall not be released to anyone other than the client without the expressed written permission of the client. These transactions shall be handled by the Customer Service Office.

7.9 Records Dispensation

In the unlikely event that the laboratory transfers ownership or goes out of business, all clients will be notified in writing and requested to notify Microseeps concerning the dispensation of their records.

Review Date: January 9, 2013

Exhibit 1

Subcontractor Laboratories

Name	Requested Analyses
Pace Analytical Services Greensburg, PA	Semivolatile organics, Pesticides, PCB's, Herbicides, EDB by 8011,Gasoline and Diesel Range Organics, Metals, General Chemistry Parameters, Oil & Grease, Volatiles in soil
Pace Analytical Services Indianapolis, IN	8021 volatiles
Pace Analytical Services Minneapolis, MN	TO-14 Suma canisters
Analytical Laboratory Services Middletown, PA	TOX, EOX, PAH's by 525, TPH
Alternative Testing Laboratory Latrobe, PA	Silicon, Percent Chloride on Ash, Total Carbon
Microbial Insights Rockford, TN	Dehalococcoides, Phospholipid Acids

Name	**Requested Analyses**
Pace Analytical Services Seattle, Washington location	All analyses for DoD projects
Microbac Warrendale, PA	Fecal and Total Coliform
Test America Nashville, TN	Formaldehyde
Test America Pittsburgh, PA	Anions (9056), TOC Walkley Black, Lloyd Kahn
Geochemical Testing Somerset, PA	NEPO
University of OK	CSIA-Hydrogen, CSIA-Chlorine, CSIA-Chlorinated (soil gas-Vapor)
ZYMAX	CSIA-Hydrogen (soil gas-Vapor)
Isotech	CSIA-Methane (soil gas-Vapor)

8.0 Measurement Traceability

Traceability of measurements and standards is insured in the laboratory by using balance calibration weights that are traceable to national standards, calibrating thermometers using an NIST calibrated thermometer, and by the use of certified standard solutions.

8.1 Reagents and Standards

The purity of the materials required in analytical chemistry varies with the type of analysis, the parameter being measured, and the sensitivity of the detection system. In general analytical reagent grade is satisfactory for most inorganic analyses. Other analyses, such as trace organic, may require special ultra-pure reagents. In cases were the method does not specify the purity of the reagent, it is intended that analytical reagent grade be used. The labels on the container are checked and the contents examined to verify that the purity of the reagents meets the needs of the particular method involved.

8.1.1 Reagent and Standard Preparation

Reagents are prepared and standardized with the utmost of care against reliable primary standards. They are re-standardized or prepared fresh as often as required by their stability as specified by method and other reference sources. Stock and working standard solutions are checked regularly for signs of deterioration.

Standard preparation procedures are specific to the analytical determination being made and are defined in detail in specific technical Standard Operating Procedures, regulatory methods, and in the laboratory's Standards Logbooks.

8.1.2 Reagent and Standard Labeling and Storage

Standard solutions are labeled with the compound name, lot number, preparation date, and expiration date. The analysts store reagents and solvents in a manner that prevents contamination and deterioration prior to their use. Standard solutions are stored in compatible containers.

Microseeps Standard Operating Procedure for Analytical Standards and Reference Materials (SOP-ADM 15) gives detailed instructions for handling, storing, labeling, and documenting standards and reference materials.

8.1.3 Standards Preparation Logbook

Standard Preparation Logbooks are issued as controlled documents to every analyst or laboratory in which they will be used. These logbooks are used to document standard preparation procedures, dates, lot numbers, concentrations, manufacturer, expiration date, and any other information that may be necessary in order to re-create or track a particular standard. The compound or element name and/or formula are documented along with the final concentration or normality. The description of how reagents and standards are prepared may be referenced from a previous description if the exact procedure is used.

8.1.4 Traceability of Standards

The traceability of each purchased stock standard is easily accessible. Certificates of analysis of each standard are maintained in a binder in the laboratory until the standard is depleted or disposed. The certificate is then given to the quality assurance manager for archiving. The traceability of each laboratory prepared standard is entered into standard logbooks.

For DoD projects: All bottles, reagents, solvents, and supplies used in DoD projects will be verified or certified by the supplier to meet or exceed standard specifications for environmental tests concerned. Verification must be kept on file to qualify each bottle, reagent, solvent and supply.

8.2 Thermometers

All of the laboratory thermometers in use are calibrated annually using a thermometer that is traceable to NIST. Thermometer calibration is outlined in Microseeps Standard Operating Procedure for Calibration of Thermometers (SOP-ADM 12).

8.3 Weights and Balances

All balances are calibrated before use with Class I NIST traceable weights that are calibrated annually. Balances are serviced and calibrated by an outside contractor annually. Additional information is outlined in Microseeps Standard Operating Procedures for Calibration of Weights and Balances (SOP-ADM 11).

Review Date: April 9, 2013

9.0 Training Program

Training for laboratory personnel is accomplished at several levels. Areas for which training is conducted include new employee orientation, laboratory safety, specific task training, analytical procedure training, laboratory ethics, and other technical training courses as the need arises.

Analytical training, while addressed in general in this manual, is addressed specifically in the Standard Operating Procedure for Administering and Documenting Training in Laboratory Procedures and Instrumentation (SOP-ADM 02).

9.1 New Employee Orientation

Orientation is conducted to familiarize new employees with company policies, quality system procedures, facilities, coworkers, laboratory ethics, and laboratory safety. The Department Managers are responsible for notifying the various departments of the start date of all new employees.

9.2 Laboratory Safety

Upon hire, each employee is required to read the laboratory's Chemical Hygiene Plan (safety manual), is issued a pair of safety glasses, and is instructed in basic laboratory safety requirements. Safety Meetings are mandatory for all employees and are held on a quarterly basis by the Safety Supervisor. Documentation of safety training is updated and maintained by Microseeps' Safety Supervisor.

9.3 Task Training

Task training must be successfully completed for employees to perform the following tasks without direct supervision:

- Sample Receiving
- Bottle Preparation
- Customer Service
- Data Entry

Task training is conducted by the Department Manager of the department concerned. During this training, the trainer works closely with the trainee to ensure that all pertinent points of procedures are addressed. If the procedure is outlined in a Standard Operating Procedure (SOP), the trainee is charged with reading the SOP and the trainer will ensure that the training covers all aspects of the SOP. For training to be considered complete, proficiency in the task must be demonstrated to the trainer.

9.4 Analytical Method Training

Prior to conducting analysis on client samples, all analysts must demonstrate their proficiency through initial technical training. Analytical proficiency must be demonstrated annually thereafter. All analytical method training must be conducted by an analyst who is certified in the method for which training is required.

For individual analyst training in sample preparation and analysis, initial training and proficiency is demonstrated through the analysis of a set of 4 consecutively run mid-range standards or an Initial Demonstration of Proficiency (IDOP). When an analysis involves a work group (i.e. semivolatile preparation and analysis), a team approach to the IDOP applies. When each individual completes their part in the successful analysis of the IDOP, the analytical team is considered competent to conduct the analysis on client samples.

For continued demonstrations of capability for individuals and work groups, one of the following procedures may be used:

1) Another IDOP
2) Four consecutively run laboratory control samples that fall within laboratory/method acceptance criteria.
3) Acceptable analysis of Performance Evaluation samples.
4) Acceptable analysis of blind quality control sample.

Training documentation is maintained in the Quality Systems Office. See Exhibit 9-1 for a flow diagram of analytical method training. A Demonstration of Capability Certification Statement (Exhibit 9-2) shall be maintained for each method in which an employee is certified. This documentation is kept in the Employee Training Records in the Quality Systems Office.

9.5 Laboratory Ethics Training

All employees shall receive initial and annual ethics training. The training shall be conducted by Microseeps' management or designated trained personnel. The training shall include the contents of the Ethics Program (see Appendix C) in its entirety, including employee and supervisory responsibilities, examples of unethical behavior, disciplinary action for unethical actions, and a means to report unethical actions.

Documentation of Ethics Program Training is kept in the Quality Systems Office. All employees are required to sign and date the Ethics and Data Integrity Agreement (see Exhibit 9-3). This form shall be placed in the employees personnel file.

9.6 Other Technical Training

Other types of technical training are conducted on an as-needed basis and may include training on new instruments, new procedures, or new equipment. Training may be conducted by Microseeps' employees

9.7 External Training

Employees are encouraged to continue their education through the use of symposia and seminars conducted by professional societies, regulatory agencies, and equipment manufacturers. These courses serve as one way for laboratory personnel to remain current on regulatory trends, analytical procedures, and advances in instrumentation. Documentation of external training will be added to the analysts' training records.

Review Date: April 9, 2013

Exhibit 9-1

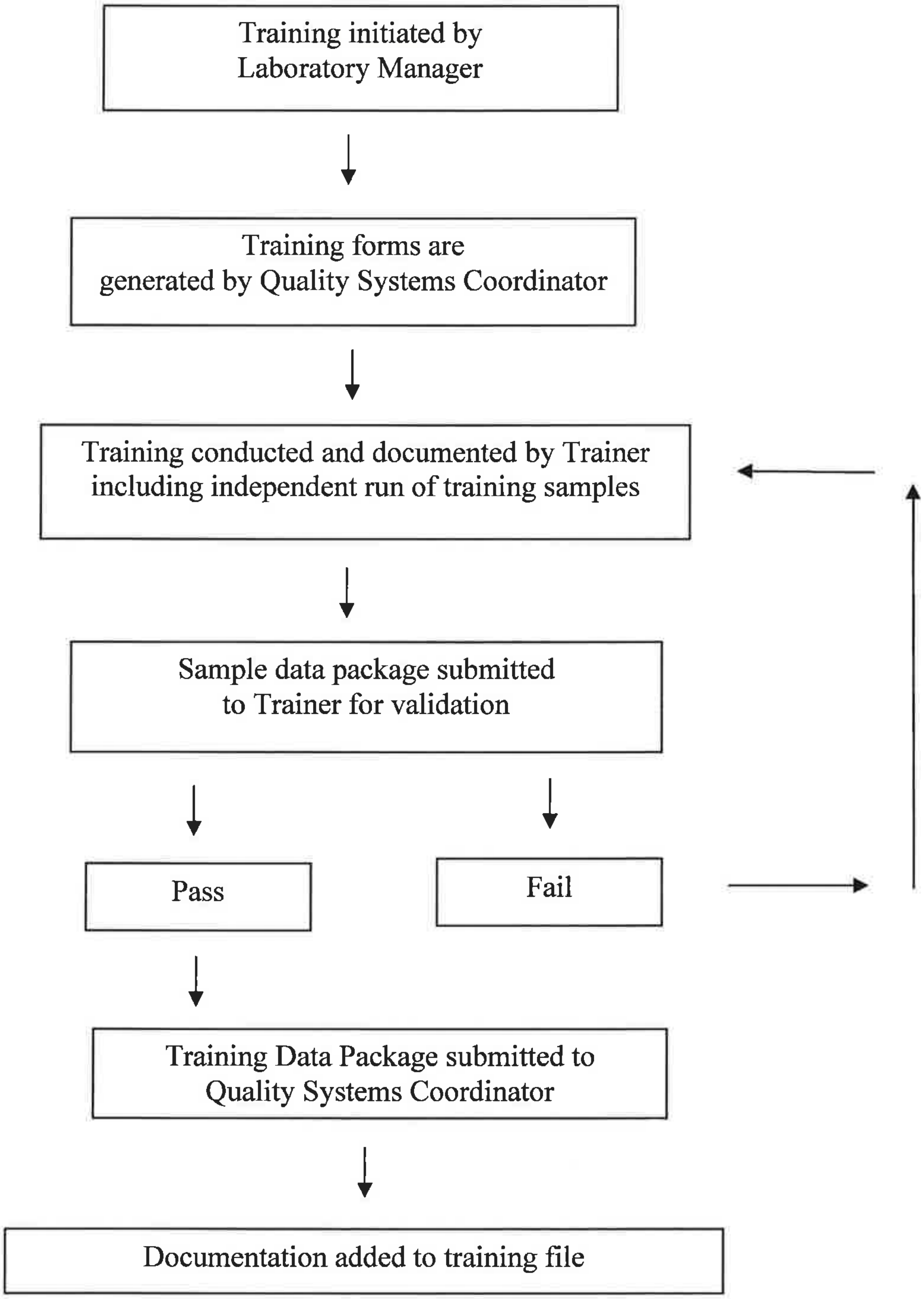

Training initiated by Laboratory Manager
Training forms are generated by Quality Systems Coordinator
Training conducted and documented by Trainer including independent run of training samples
Sample data package submitted to Trainer for validation
Pass
Fail
Training Data Package submitted to Quality Systems Coordinator
Documentation added to training file

Exhibit 9-2

Demonstration of Capability Certification Statement

Date: ______________________________

Microseeps, Incorporated
220 William Pitt Way
Pittsburgh, PA 15238

Analyst Name: ______________________________

Matrix: (laboratory pure water, soil, air, matrix spike)

Analyte (or group)	Method Number	SOP #	Revision #

I, the undersigned, CERTIFY that:

1. The analyst(s) identified above, using the cited test method (s), which is in use at this facility for the analyses of samples under the National Environmental Laboratory Accreditation Program, have met the Demonstration of Capability.

2. The test method was performed by the analyst(s) identified on this certification.

3. A copy of the test method and the laboratory-specific SOPs are available for all personnel on-site.

4. The data associated with the demonstration of capability are true, accurate, complete, and self-explanatory.

5. All raw data (including a copy of this certification form) necessary to reconstruct and validate these analyses have been retained at the facility, and that the associated information is well-organized and available for review by authorized assessors.

______________________________ ______________
Patrick McLoughlin, Ph.D. Date
Technical Director

Exhibit 9-3

Microseeps, Incorporated

ETHICS AND DATA INTEGRITY AGREEMENT

I, ________________________, state that I understand the high standards of integrity required of me with regard to the duties I perform and the data I report in connection with my employment at **Microseeps, Incorporated.**

I agree that in the performance of my duties at Microseeps:

I. I shall not intentionally report data values that are not the actual values obtained;

II. I shall not intentionally report the dates and times of data analyses that are not the actual dates and times of data analyses; and

III. I shall not intentionally represent another individual's work as my own.

I agree to inform Microseeps of any accidental reporting of non-authentic data by myself in a timely manner.

I agree to inform Microseeps of any accidental or intentional reporting of non-authentic data by other employees.

I have read, acknowledge, and understand my personal ethical and legal responsibilities including potential punishments and penalties for improper, unethical, or illegal actions.

______________________________ ____________________
Signature Date

Appendix A

Key Personnel Job Descriptions

President and Senior Product Manager

General Description: This exempt position is responsible for the overall administrative, technical, and financial direction of the corporation.

Educational Requirements: This position requires an MS or PhD in Chemistry or related field and ten+ years of experience in In-Situ Remediation Services.

Job Responsibilities:

- Responsible for overall technical and financial performance of the company.
- Manage the team of Product managers.
- Responsible for the conception and development of new products.
- Responsible for all mechanisms of client contact, including Customer Care, the website, the blog, the implementation of workshops and webinars, and other forms of customer contact opportunity as they are conceived and implemented.
- Responsible for the generation of leads and qualified leads.
- Consider all personnel recommendations within his supervised group and make recommendations to the Executive Board.

Senior Business Executive

General Description: This exempt managerial position is responsible for providing corporate management of the organization.

Educational Requirements: This position requires a graduate degree and/or ten or more years of experience in business management.

Job Responsibilities:

- Responsible for producing and maintaining the financial framework to monitor and guide the direction of the business cycle.
- Responsible for setting up and monitoring departmental budgets.
- Oversees general office management.
- Oversight of Human Resource functions.
- Responsible for overall safety of the company.
- Oversight of the Quality Systems Department.

Director of Finance and Information Services

General Description: This exempt managerial position is responsible to and reports to the Senior Business Executive to provide ongoing periodic financial reports and business reviews as the business cycle requires and demands.

Educational Requirements: This position requires a Bachelors Degree in Business.

Job Responsibilities:

- Prepare monthly financial statements for review.
- Reconcile bank statements.
- Prepare monthly budget performance reviews.
- Account Receivable tracking and resolution.
- Cash management recommendations and review.
- Payroll processing activities.
- Insurance review.
- Office Management.

Natural Attenuation Services Product Manager

General Description: This exempt managerial position is responsible for guiding a team that is charged with the NAS product line performance as a business unit. The team includes departments dealing with dissolved gases, vapor, electron donors, electron acceptors and general chemistry.

Educational Requirements: This position requires a bachelor's degree in Chemistry or related field and three years+ of product and product instrumentation experience or ten+ years of relevant product and product instrumentation experience.

Job Responsibilities:

- Manage the integration of routine and development of activity within the NAS department.
- Manage and operate the LIMS System.
- Advise the SPM of capital equipment needs.
- Recommend specific capital equipment for purchase or lease.
- Maintain budgetary restraints for profitability.
- Make personnel recommendations to the SPM.
- Responsible for laboratory code of conduct and staff disciplinary action.

Laboratory Manager

General Description: This exempt managerial position is responsible for overseeing the daily management of the laboratory operations and operations' staff. This position reports to the Natural Attenuation Services Product Manager.

Educational Requirements: This position requires a Bachelor's Degree in Chemistry or a related field with a minimum of ten years of experience.

Job Responsibilities:

1. Provide supervision and direction to all Natural Attenuation Services personnel.

2. Manage the size of the Natural Attenuation Services Department efficiently in accordance with available workload and communicate staffing requirements to the Natural Attenuation Services Product Manager.

3. Responsible for scheduling work and laboratory personnel to ensure efficient use of time and resources.

4. Manage routine Natural Attenuation Services product generation within the laboratory, including but not limited to scheduling of sample screening and analyses, evaluation of preliminary results, assessment of quality, and preparation of client Natural Attenuation Services reports.

5. Responsible for ensuring that the highest degree of technical quality possible is represented in outgoing final analytical data reports.

6. Ensure that laboratory work assignments are coordinated with work assignments of other groups in the company.

7. Work in conjunction with the Manager of Technical Services to provide input and support for instrumentation needs.

8. Coordinate with the Quality Systems Manager to develop, review and implement Standard Operating Procedures.

9. Support and enforce the specific methods, policies, and procedures outlined in Microseeps' Standard Operating Procedures and Quality Systems Manual.

10. Coordinate and ensure MDLs, and PQLs are updated in the LIMS as required.

11. Responsible for the administration of the Chemical Hygiene Plan within the laboratory.

Quality Systems Manager

General Description: This exempt managerial position carries the responsibility for providing leadership and direction to ensure that the laboratory function at the highest level of quality possible in accordance with regulatory and certification requirements. The term Technical Director is used synonymously with the Quality Systems Manager.

Educational Requirements: This position requires a Bachelor's degree in chemistry or a related discipline and a minimum of ten years of laboratory experience.

Job Responsibilities:

1. Provide leadership and direction for the laboratory's Quality Systems Program.
2. Provide supervision and delegate tasks to the Quality Systems Coordinator.
3. Keep current on regulatory requirements to ensure that Standard Operating Procedures for analyses are in compliance with applicable regulations.
4. Conduct laboratory quality audits according to the annual schedule.
5. Serve as liaison between Microseeps and Regulatory Agencies.
6. Provide leadership and direction for developing and maintaining all Laboratory Standard Operating Procedures and the Quality Systems Manual.
7. Work with the Quality Systems Coordinator and the Laboratory Manager to discern and correct issues leading to poor quality and, if deemed necessary stop unsatisfactory work or prevent reporting of unjustifiable results.

Instrumentation Specialist

General Description: This exempt managerial position is responsible for overseeing the use of instrumentation. This position reports to the Senior Business Executive.

Educational Requirements: This position requires a Bachelor's Degree in Chemistry or a related field with a minimum of ten years of experience.

Functional Job Description

1. Evaluate the technical aspects and justify the cost of newly proposed instrumentation or existing instrument upgrades.
2. Maintain and repair of equipment and apparatus being used at Microseeps.
3. Provide support for equipment and data interfacing to the LIMS.
4. Recommend upgrades to laboratory apparatus to meet method requirements and to maintain Microseeps position as a leading-edge technology provider.
5. Reviews and participates in new hardware and software purchases for technical instrumentation.

Technical Director

General Description: The Technical Director is responsible for directing and managing an ongoing research and development program that insures the laboratory is ready to respond to leading edge technology needs.

Educational Requirements: This position requires a graduate degree in chemistry or a related discipline and a minimum of ten years of laboratory experience.

Job Responsibilities:

1. Provide assistance with interpretation of client data needs and data reports in cooperation with the Customer Service Department.
2. Assist clients in defining data needs, constructing sampling plans and interpreting data reports via non-binding suggestions and selected references to published documents.
3. Prepare and present presentations at seminars, workshops, or conferences.
4. Develop written material for company personnel to provide client assistance and education.
5. Identify emerging analytical needs and and develop conceptual models for analytical methods to support those emerging client needs.
6. Develop conceptual analytical methods into routine procedures for lab personnel to implement.
7. Ensure that new method development is fully documented by compiling a complete package of experimental data in a form that is organized, summarized, and that can be validated.
8. When new analytical methods have become routine procedures, transfer responsibility to the Laboratory Manager.
9. Responsible for knowing industry trends and emerging opportunities.

Director of Customer Care

General Description: This exempt managerial position is responsible for directing the activities of the Customer Care Staff and Bottle Preparation. This position is ultimately responsible for ensuring customer service satisfaction. This position reports directly to the Senior Product Manager.

Educational Requirements: This position requires 10+ years of environmental laboratory management experience.

Job Responsibilities:

1. Responsible for overall management of the Customer Care Department which includes the traditional customer service functions, bottle preparation and shipping.
2. Responsible for direct involvement with clients in all extraordinary issues such as late reports, missing shipments, inappropriate charges, etc..
3. Responsible to direct all inquiries to the proper department.
4. Responsible for customer care code of conduct and disciplinary action.
5. Knowledgeable of all the functions of a Customer Care Representative.
6. Oversee the review of contracts.
7. Oversee purchasing for Bottle Preparation.
8. Act as liaison with other departments to ensure interdepartmental communication.
9. Ensure customer complaints are resolved to the customer's satisfaction.

Quality Systems Coordinator

General Description: This exempt position is responsible for assisting the Quality Systems Manager to ensure that the Quality Systems Policies and Procedures are implemented in accordance with the Quality Systems Manual and Microseeps Standard Operating Procedures. This position reports to the Quality Systems Manager.

Educational Requirements: This position requires a Bachelor's Degree and 2 years of laboratory experience.

Job Responsibilities:

1. Administratively responsible for the Quality Systems Program as directed by the Quality Systems Manager.
2. Prepare an annual schedule of laboratory audits.
3. Prepare audit reports and necessary corrective action to the Laboratory Manager.
4. Follow up on all corrective action reports until appropriate action has been taken.
5. Establish a schedule, order supplies, coordinate, and submit final analytical data for performance evaluation studies.
6. Maintain, control, and update the Quality Systems Manual and all of Microseeps' Standard Operating Procedures.
7. Ensure new Operation's Department employees receive required training and orientation and maintain the documentation of the training.
8. Ensure appropriate studies are conducted when necessary i.e. Initial Demonstrations of Proficiency and MDL's.
9. Ensure that all lab thermometers are calibrated as required.
10. Annually send out scale weights, radiation screening instrument, and NIST thermometer for calibration.
11. Coordinate annual inspections for certifications of balances and fume hoods.

Procurement Coordinator

General Description: This exempt position is responsible for all aspects of purchasing and supply receipt and reconciliation. This position reports to the Laboratory Manager.

Education Requirements: This position requires a high school diploma and two years of laboratory experience. A basic knowledge of chemistry and laboratory analytical procedures is required.

Job Responsibilities:

1. Purchase, track, receive, and distribute supplies for the laboratory.

Sample Custodian

General Description: This exempt position is responsible for all aspects of sample custody from sample receipt to storage until final disposal. This position reports directly to the Laboratory Manager.

Education Requirements: This position requires a high school diploma and two years of laboratory experience. A basic knowledge of chemistry and laboratory analytical procedures is required.

Job Responsibilities:

1. Receive and inspect samples and sample containers and sign appropriate documents according the Standard Operating Procedure for Sample Receiving and the Quality Systems Manual.
2. Record all necessary information on chain of custody.
3. In the event of any discrepancies or non-conformance issues with the above procedures, immediately complete a non-conformance form and submit it to customer service.
4. Notify Customer Care Rep upon receipt of client samples when requested.
5. Accurately log samples into LIMS ensuring that all required fields are completed for the level of analysis required.
6. Label all sample containers.
7. Initiate transfer of samples as soon after receipt as possible to appropriate storage areas, ensuring that all samples are maintained at the appropriate temperature at all times.
8. Notify analysts immediately upon receipt of samples with short holding times.
9. Control and monitors access to and storage of samples in secure storage.

Staff or Laboratory Analyst

General Description: This exempt position is responsible for the timely analysis and custody of client samples. Job responsibilities cover a broad range of duties and responsibilities depending on employee education and experience. This position reports directly to Product Manager of their department.

Educational Requirements: This position covers a range of educational levels from a high-school education with on-the-job training to a Ph.D. in Chemistry or a related field. Analysts must pass Initial Demonstrations of Proficiency for every analytical method before independent analysis can be conducted.

Physical Requirements: This position requires the ability to lift 20 pounds and the ability to stand for extended periods of time.

Job Responsibilities:

1. In matters concerning order and priority of analysis, this position is accountable to, and will take direction from the Product Manager of their department.
2. Keep all workspaces neat, clean, and organized.
3. Obtain samples from Sample Receiving.
4. Observe internal chain of custody requirements for all samples taken from Sample Receiving.
5. Ensure all aliquots analyzed are representative of the entire sample.
6. Analyze samples according to Microseeps Standard Operating Procedures (SOP) and or the applicable Standard or EPA Methods.
7. Observe and practice applicable quality control procedures in accordance with the Laboratory Quality Systems Manual and specific SOPs. This includes analyzing required quality control samples, ensuring results are within specified acceptance limits, and initiating corrective action when results are outside of acceptable parameters.
8. Analyze samples arriving with short holding times within the applicable time frame.
9. Review peer analytical data for completeness and accuracy where possible.

10. Responsible for making accurate entries into logbooks.

11. Conduct equipment preventative maintenance according to the Equipment Maintenance SOP.

12. Maintain supply inventory and notify lead analyst when laboratory supplies are needed.

13. Comply with all Health and Safety Procedures outlined in the Chemical Hygiene Plan.

14. Work with the Health and Safety Supervisor to help correct suspected unsafe practices, situations, or working spaces.

15. Identify any problems with samples, equipment, or procedures that will affect the integrity of analysis and report them to the Product Manager of their department.

Customer Care Representative

General Description: This exempt position is responsible for marketing, inside sales, and project management. This position reports to the Director of Customer Care.

Educational Requirements: This position requires a minimum of five years of customer service experience in the laboratory, environmental, or chemistry field.

Job Responsibilities:

1. Generates quotes.
2. Serves as the liaison between clients and the technical departments.
3. Takes bottle orders from clients.
4. Enter projects into the LIMS.
5. Manage projects as required according to client contracts.
6. Signs final data reports acknowledging that the reports are being sent.
7. Contact clients as required by Non-Conformance Forms.
8. Arrange rush and special analytical projects with Laboratory Manager.
9. Coordinate initial review of contracts.
10. Serve as Microseeps representative to the client and as such, conduct themselves with the highest standard of ethics, is responsive to clients' needs, and portrays a level of professionalism for which Microseeps is known.
11. Create, generate, and disseminate company information to clients as requested.
12. Review invoices for accuracy.

LIMS Administrator

General Description: The LIMS Administrator position is responsible for the overall development, testing, maintenance, documentation, and support of all Electronic Data Deliverable (EDD) related processes, code and transactions. The Customer Service Assistant aspect of the position is responsible for specific customer service activities as they relate to the coordination of project work and consistently provides work on a timely basis.

Educational Requirements: This position requires High School education plus an Associate degree in Information Technology. Two years experience working with Electronic Data Interchange processes. Must also possess strong skills with SQL scripting and SQL Stored Procedures, as well as abilities with Microsoft SQL Server, Enterprise Manager, and Query Analyzer.

Job Responsibilities:

1. Provide technical support for all EDD related implementations.

2. Analyze client requirements, specify design, and develop new EDD solutions.

3. Modify and enhance existing EDD related code or procedures.

4. Provide customer support and correct reported problems with EDDs.

5. Utilize and develop procedures for EDD checking utilities, formatting applications and other tools as necessary.

6. Develop and publish documentation and procedures regarding proper uses and operations of the EDD environment as well as individual EDD requirements, structure, code, and results.

7. Perform training for responsible parties on the use of EDD related processes.

8. Work with customers, staff, external IT consultants and managers for both new development and problem determination/resolution.

9. Assure the highest levels of stability, integrity, reliability, performance, security, and availability of EDDs consistent with the resources available and the established change control policies, and prescribed procedures.

10. Use established user request and problem management tool to track requests and follow up to resolution and closure.

11. Perform special projects or other duties as required.

12. Review and check project files when received from login for correctness and completeness.

13. Review and prepare data packages by paginating data, scanning reports, and burning CDs.

14. Prepare and send Excel reports and invoices to clients electronically.

15. Receive and fill out bottle orders for clients when taking client calls.

16. Answering the telephone when required for customer satisfaction.

Bottle Preparation Technician

General Description: This non-exempt position consists of up to forty hours of work per week in completing bottle preparation activities. This position reports to the Director of Customer Care.

Educational Requirements: High School Diploma with knowledge in basic chemistry. Computer skills are required, as well as, competencies in basic math, reading, and writing.

Physical Requirements: The position requires a maximum lifting capacity of 40 pounds with the ability to lift and carry large and bulky objects. The job skills also require a full range of motion for bending over and straightening.

Job Responsibilities:

1. Properly assemble, prepare, preserve, package and ship orders following Company Standard Operating Procedures in a cost effective and timely manner.
2. Inventory, order, track, and stock all necessary bottle preparation supplies.
3. Track, maintain, and fill all standing bottle orders for pick-up, delivery, and shipment.
4. Keep accurate records and files of standing orders, supply orders, and inventories.
5. Practice open communication in all instances with the Customer Care department in order to assure clients get the best possible service.
6. Maintain a neat, clean, and organized work and storage area.
7. Wear safety glasses while in bottle preparation room, and other protective clothing such as gloves and smocks when using chemicals, handling samples, and cleaning coolers.
8. Serve as courier for pick-up or delivery when necessary.
9. Clean and dry all coolers that arrive prior to placing them in storage.
10. Obtain stock preservatives.

Review Date: April 9, 2013

Appendix B

References

REFERENCES

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Review Date: April 9, 2013

Appendix C

Microseeps Ethics Program

Microseeps, Incorporated

Ethics Program

Approved by: Thomas W. Hill Date: 2-5-13

Thomas W. Hill
Senior Business Executive

1.0 Introduction

At Microseeps, we are committed to operating with integrity. We value the integrity of the individual and the institution. We value honesty and trust in the way we treat one another and in the way we meet our commitments. Consistent with our commitment to integrity, our Ethics Program is based on values. For the program to succeed, each employee must use his or her own values to make decisions that reflect well on the employee and on the company.

This program will encompass defining improper, unethical, and illegal actions, outline responsibilities, and identify ways in which the laboratory can prevent and/or detect these types of actions. This program shall identify specific examples of improper, unethical, or illegal actions and establish potential punishments and penalties for the same. This program shall include initial and annual ethics training.

The Ethics and Data Integrity Agreement (see Exhibit 1) shall be read and signed by every Microseeps' employee. This program shall designate one individual to whom company personnel can report improper, unethical, or illegal practices.

2.0 Definitions

Improper Actions: Deviations from contract-specified or method-specified analytical practices which may be intentional or unintentional.

Unethical or Illegal Actions: The deliberate falsification of analytical or quality assurance results, where failed method or contractual requirements are made to appear acceptable (also known as laboratory fraud).

3.0 Responsibility

3.1 Laboratory Managers and Supervisors

The Laboratory management and supervisors at all levels are responsible for:

- Implementing the Ethics Program
- Providing clear guidelines on matters of everyday conduct to all employees.
- Stressing to all employees the need for a commitment in word and deed to the ethics policy and practices.
- Demonstrating their own commitment to the ethics policy and practices in the management of their area of responsibility and the activities of all employees under their supervision.
- Maintaining a workplace environment that encourages frank and open communication, free from the fear of reprisal, concerning the upholding of the ethics policy and practices.
- Distributing the Ethics Program to all employees.

- Developing and presenting training to ensure that all employees understand the laboratory's ethics principles and practices.
- Provide continuing counsel on laboratory practices, policies, rules, and regulations to any employee who seeks assistance.
- Maintaining working conditions supportive of employee responsibilities.
- Enforcing compliance with the ethics policy and practices.
- Recognizing employees who make exemplary efforts to implement and uphold the ethics policy and practices.
- Reviewing and investigating all allegations of wrongdoing.
- Ensuring that all current and new employees under their supervision have received a copy of the Ethics Policy and are trained in its meaning and applications.
- Reviewing the level of Ethics Policy knowledge and understanding of the employees under their supervision.

The Quality Assurance office is instrumental in ensuring that these requirements are completed.

3.2 Employees

All employees are responsible for:

- Reviewing regularly their knowledge and understanding of the ethics policy and practices.
- Upholding the ethics policy and practices as demonstrated in their daily conduct.
- Contributing to a workplace environment that is conducive to the maintenance of the ethics policy and practices in daily activities.
- Seeking help when the proper course of action is unclear or unknown to them.
- Remaining alert and sensitive to situations that could result in actions by any employee that are improper, illegal, unethical, or otherwise in violation of the ethics policy and practices.
- Counseling fellow employees when it appears that they are in danger of violating the ethics policy and practices.
- Reporting violations of the ethics policy and practices to their supervisor, or higher-level management.
- Writing thorough case narratives explaining why analytical data may or may not be useful due to anything in the analytical process that may have been wholly or partially deficient.

4.0 Prevention and Detection

A key element in preventing fraud is the adoption of an ethics policy that is strictly enforced. Having employees that understand the difference between a mistake and improper behavior and that are trained to make ethical decisions is one of the best prevention strategies. A strongly reinforced ethics-training program is one of the key cornerstones to an effective total ethical process.

4.1 Examples of Unethical Actions

There are a number of laboratory practices, which may constitute fraud. The following are some examples:

- Falsification of results to meet method requirements.
- Reporting of results without analyses to support (i.e. dry-labbing).
- Selective exclusion of data to meet QC criteria (initial calibration points dropped without technical or statistical justification).
- Misrepresentation of laboratory performance by presenting calibration data or QC limits within data reports that are not linked to the data set reported.
- Notation of matrix interference as a basis for exceeding acceptance limits (typically without implementing corrective actions) in interference-free matrices (e.g. method blanks or laboratory control samples).
- Unwarranted manipulation of computer software (e.g. improper background subtraction to meet ion abundance criteria for GC/MS tuning, chromatographic baseline manipulations).
- Improper alteration of analytical conditions (e.g. modifying EM voltage, changing GC temperature program to shorter analytical run time) from standard analysis to sample analysis.
- Misrepresentation of QC samples (e.g. adding surrogates after sample extraction, omitting sample preparation steps for QC samples, over-spiking or under-spiking).
- Reporting results from the analysis on one sample for those of another.

4.2 Prevention and Detection

The Nonconformance form can be used as a means to report improper, unethical, or illegal actions. The form should be completed and submitted anonymously (if desired) to the Technical Director. An immediate investigation shall be conducted by a member of Microseeps' management to ascertain if a violation did occur.

Other means of prevention and detection include an Internal Audit Program, an ethics-training program, and a requirement for analyst notation and sign-off on manual integration changes to data.

4.3 Disciplinary Action for Unethical Actions

Because the implications of unethical actions are substantial, swift and decisive disciplinary action shall be carried out for violations of the Ethics Policy. If an investigation reveals knowing and willful violation of laboratory ethics by an employee, that employee shall be terminated. Other violations can result in disciplinary actions that range from verbal warnings to written warnings with time off. The severity of the discipline shall match the severity of the offense. All ethics violations shall be documented in employee's personnel files.

5.0 Training

All employees shall receive initial and annual ethics training. The training shall be conducted by Microseeps' management or designated trained personnel. The training shall include the contents of this policy in its entirety, employee and supervisory responsibilities, examples of unethical behavior, disciplinary action for unethical actions, and a means to report unethical actions.

5.1 Ethics Training Documentation

Training documentation shall be maintained in the Quality Systems Office. All employees are required to sign and date Exhibit 1, the Ethics, and Data Integrity Agreement. This form shall be placed in the employees training file.

5.2 Training Frequency

Initial training shall be conducted within two weeks of all initial hires and annually thereafter.

Review Date: February 5, 2013

Microseeps, Incorporated

ETHICS AND DATA INTEGRITY AGREEMENT

I, _________________________, state that I understand the high standards of integrity required of me with regard to the duties I perform and the data I report in connection with my employment at **Microseeps, Incorporated.**

I agree that in the performance of my duties at Microseeps:

I. I shall not intentionally report data values that are not the actual values obtained;

II. I shall not intentionally report the dates and times of data analyses that are not the actual dates and times of data analyses; and

III. I shall not intentionally represent another individual's work as my own.

I agree to inform Microseeps of any accidental reporting of non-authentic data by myself in a timely manner.

I agree to inform Microseeps of any accidental or intentional reporting of non-authentic data by other employees.

I have read, acknowledge, and understand my personal ethical and legal responsibilities including potential punishments and penalties for improper, unethical, or illegal actions.

_____________________________________ ____________________
Signature Date

QUALITY ASSURANCE MANUAL

Revision 12

January 7, 2013

**2340 Stock Creek Blvd.
Rockford, TN 37853-3044
Phone: (865) 573-8188 & Fax: (865) 573-8133
*www.microbe.com***

Approved By:

Anita Biernacki

01/07/2013

Operations Manager **Date**

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Appendix A

ABBREVIATIONS AND ACRONYMS

AIHA	American Industrial Hygiene Association
ASTM	American Society of Testing and Materials
CDC	Centers for Disease Control and Prevention
COC	chain-of-custody
CRM	certified reference material
°C	degrees Celsius
DI	deionized water
DNA	Deoxyribonucleic acid
DOC	Demonstration of Capability
DOE	Department of Energy
EDD	electronic data deliverable
EMPAT	Environmental Microbiology Proficiency Analytical Testing Program
EPA	U.S. Environmental Protection Agency
HVAC	heating, ventilation, and air conditioning
ISO	International Standards Organization
LCS	laboratory control sample
LIMS	Laboratory Information Management System
MI	Microbial Insights, Incorporated
MB	method blank
MDL	method detection limit
NASA	National Aeronautics and Space Administration
NCR	Nonconformance Report
ND	not detected
PCR	Polymerase Chain Reaction
PLFA	phospholipid fatty acid analysis
PT	proficiency testing
%R	percent recovery
QA	quality assurance
QAM	Quality Assurance Manual

ABBREVIATIONS AND ACRONYMS (Cont')

QC	quality control
RL	reporting limit
RO	reverse osmosis
RPD	relative percent difference
RSD	relative standard deviation
RT	reverse transcriptase
S	standard deviation
SOP	standard operating procedure
SOW	statement of work

1. Introduction, Purpose, and Scope

1.1. Company Overview

Microbial Insights, Inc. (MI) was founded in 1992 as a technology transfer effort from research developed by Dr. David C. White, M.D., Ph.D. from the University of Tennessee's Center for Biomarker Analysis (formerly The Center for Environmental Biotechnology), and the Oak Ridge National Laboratory. MI was established to provide rapid, cost-effective, cutting-edge analytical methods to characterize microbial communities using biochemical approaches to analyze microbial lipids.

In 1998, MI pioneered the commercial use of DNA technology as a method of analyzing entire bacterial communities, which complimented the conventional lipid analyses. When used together, these methods provide a complete and comprehensive assessment of microbial communities for clients facing regulatory issues by providing direct lines of support for making decisions.

MI offers unique molecular and biochemical technologies to diverse clientele, which includes universities, environmental consulting companies, lawyers, and governmental organizations from around the globe.
For simplicity sake, from this point forward; Microbial Insights, Inc. will be referred to as "MI."

1.2 Description of Testing Services

Microbial Insights, Inc. offers a variety of services to meet project-specific needs. Using molecular and chemical analyses, microbial communities are characterized directly from samples without the limitations associated with culturing. MI offers a wide range of microbiology testing services including:

- *Phospholipid Fatty Acid Analysis (PLFA Analysis)* provides a quantitative way to assess viable biomass, community structure, and metabolic activity. This lipid profiling method provides information about the biomass, the relative quantities of particular bacterial groups, and the physiological status of microorganisms in a particular environment.
- *Denaturing Grandient Gel Electrophoeresis (DGGE)* provides qualitative information about the prominent organisms and their potential activity. This DNA-based analysis can identify specific organisms present in a sample, and describe their potential metabolic activities, such as contaminant degradation.
- Real-Time Polymerase Chain Reaction (qPCR), provides a rapid way to quantify specific target populations. The DNA-Based approach uses primers and probes that are designed to specifically target Deoxyribonucleic Acid (DNA) from a wide range of organisms including, "known" dechlorinating bacteria (e.g. *Dehalococcoides spp.)*, *Geobacter spp.,* Sulfate and Iron Reducing bacteria and even fungi. (Currently, over 100 of the most common indoor air fungi can be identified using the EPA's method which MI has licensed.)
- Culturing based methods are used for enrichment of degrading bacteria or targeting of a specific subpopulation.
- VFAs, Anions and MEE analyses provide information concerning the concentrations of volatile fatty acids (VFAs), anions, and methane, ethane and ethane (MEE) in a sample.

1.3 Quality Program

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of its laboratory analyses, ensuring that its clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI's QA Program is designed to minimize systematic errors, promote problem solving, and provide a system for continuous improvement within the organization.

1.4 Quality Assurance Objectives and Policies

It is MI's QA policy to:

- Provide high-quality, timely, cost effective, and consistent environmental and microbiological testing services that meet all applicable federal, state, and local regulatory requirements.
- Generate data that are scientifically sound, legally defensible, meet client objectives, and are appropriate for their intended use.
- Provide a uniform framework for generating test data.
- Instill a commitment to QA and individual excellence at all levels of the organization.
- Ensure that the appropriate type and degree of quality control (QC) are applied during sample handling, measurement, and data reporting processes.
- Ensure proper tracking of samples and data by implementing an automated laboratory information management system (LIMS).
- Implement effective chain-of-custody documentation and sample tracking processes to ensure sample integrity.
- Document the analytical methods and standard operating procedures.
- Document all aspects of the process to ensure that the analytical results can be reconstructed.
- Secure and validate data handling to protect confidential information from unauthorized disclosure.

1.5 Management Commitment to Quality Assurance

As delineated in the company's mission statement below, MI management is committed to providing the highest quality data and customer service to support the environmental testing and health and safety industries. To ensure that the data generated and reported by MI meet the requirements of its internal policies, clients, and comply with the industry standards, MI maintains an effective and well-documented QA program that is supported at all levels in the laboratory. MI stresses the importance of quality at every level in the organization and has instilled in its employees that everyone is responsible for quality. MI's management is committed to providing adequate level of personnel and resources to develop, implement, assess, and continually improve its technical and management operations.

Mission Statement

Microbial Insights, Inc.'s approach focuses on using the latest techniques in analytical chemistry and molecular microbiology to characterize microbial communities directly from environmental samples.

MI strives to offer our clients the most comprehensive, technologically advanced, and cost-effective direct analytical techniques. We are committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions.

Of utmost importance is our relationship with our client. Our goal is to be an extension of our client's' company, providing personal assistance with selection of the appropriate methodology and data analysis in a prompt, courteous manner.

1.6 Quality Assurance Manual

The purpose of the Quality Assurance Manual (QAM) is to describe the MI QA Program and to outline how the program allows all employees of MI to meet the company's QA policies. The purpose of this QAM is to document the QA Program established and used for all testing, research and development, and data production activities. Roles and responsibilities of management and laboratory staff in support of the Quality Program are described in Section 2.0.

This QAM applies to all employees of the laboratory and is made available to each employee. All members of the laboratory are committed to following this QAM.

This QAM undergoes an annual review by the operations manager and the relevant technical staff. Revisions to the QAM are distributed within the laboratory to replace the outdated copies so that only the most current revision is in use. It is the responsibility of individual Lab Directors to ensure that all analysts responsible for performing analyses have read and comply with the procedures described in this manual and associated supporting documentation.

The following key elements are addressed within MI's QAM:

- Title Page
- Table of Contents
- Quality Assurance Manual Maintenance and Update Procedures
- Organization and Responsibility
- Quality Assurance Objectives and Policies
- Personnel Qualifications and Training
- Procurement
- Sampling Materials and Procedures
- Chain-of-Custody/Sample Receiving/Sample Handling Procedures
- Reagents and Standards
- Equipment Calibration and Maintenance Procedures

- Analytical Methods
- Data Reduction, Validation and Reporting
- Internal Quality Control Procedures
- Internal Audits
- Corrective and Preventive Actions
- Client Communications
- QA Reports
- Document Control and Control of Records
- Sample Retention and Disposal
- Reference to Other Quality System Documentation

1.7 Supporting Quality Documents

MI's QA program is supported by the following quality documents:

- American Industrial Hygiene Association (AIHA) Laboratory Quality Assurance Plan (LQAP) Policy Document
- ISO/IEC Guide 17025
- Method-specific and QA-related standard operating procedures (SOPs)
- Internal quality policy statements and memorandums

2 Organization and Responsibilities

MI’s organizational structure and key personnel, presented in Figure 1 and Table 1, is designed to ensure that analytical operations are effective and cost-efficient. All levels of the laboratory staff are involved in implementing the QA program.

It is MI’s management policy to staff technical and quality positions with personnel who have the education, training, and experience adequate to accomplish their assigned duties. The Operations Manager ensures that all staff members are properly trained to perform their assigned tasks and follow the requirements specified in this document.

For key staff, resumes documenting experience and educational profiles are maintained in training files and are available upon request.

Figure 1. Laboratory Organizational Structure

Lab Organization

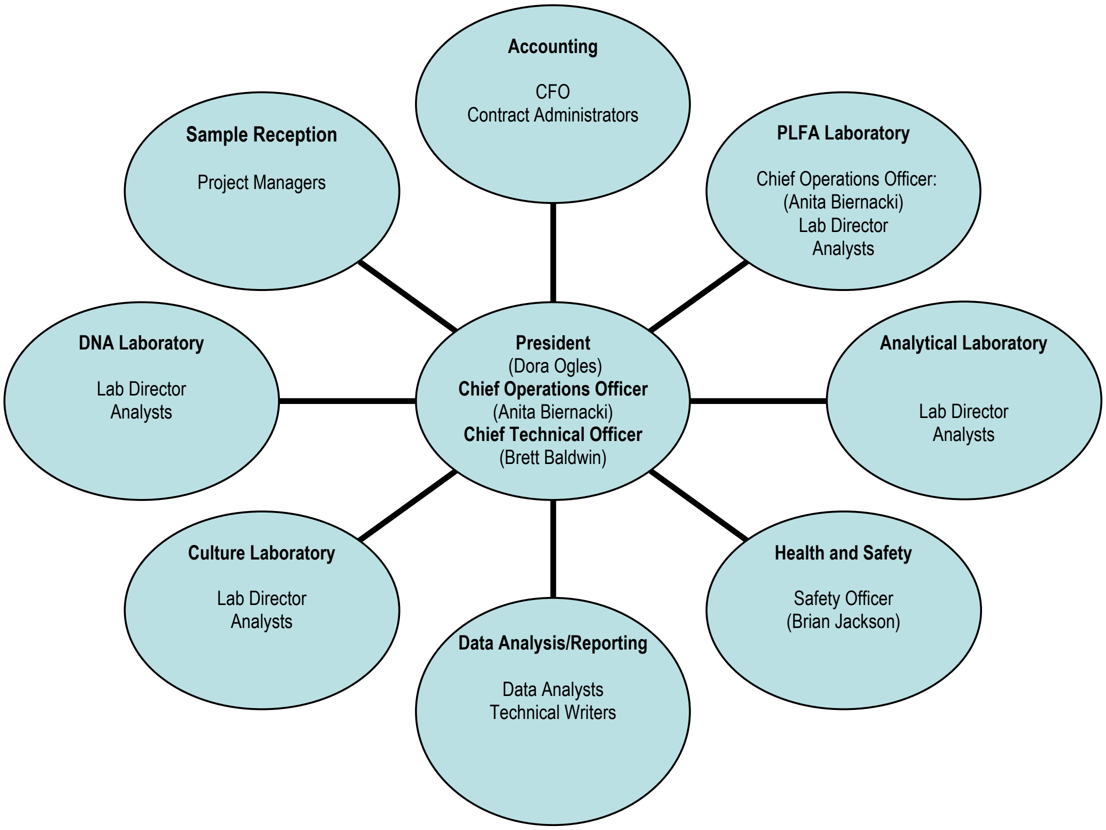


Table 1. Key Personnel List

Name	Title	Degree	Years of Relevant Exp.
Dora Ogles	President	BS, Biomedical Engineering	21
Anita Biernacki	Operations Manger	MS, Microbiology	14
Brett Baldwin	Senior Scientist	PhD, Civil Engineering	22

2.1 Roles and Responsibilities

Each employee has specific roles and responsibilities regarding the generation of data of known quality. All laboratory personnel are expected to have a working knowledge of the QAM. A copy of the most recent QAM is available to the laboratory staff. It is the responsibility of each employee to ensure that data are generated in compliance with this QAM, SOPs, and internal policies. The responsibilities of certain key functions are detailed below.

The ***Operations Manager*** is directly and ultimately responsible for ensuring data quality and providing overall operational direction at MI. Other responsibilities include:

- Long term planning, setting goals, and achieving the financial business and quality objectives of MI.
- Allocate personnel and resources throughout the laboratory section to meet project needs.
- Support QA as an essential requirement in all management, functional, and administrative areas.
- Motivate all personnel to achieve increasing levels of technical competence and responsibility.

The ***Laboratory Director*** reports directly to the Operations Manager and is responsible for the development, maintenance, and implementation of the QAM. Responsibilities include:

- Implement and oversee the quality program.
- Authority for stopping, accepting, or rejecting analytical data and method modifications.
- Conduct periodic internal audits to monitor laboratory compliance with the QAM and method SOPs.
- Develop, review, and approve laboratory documents including QAM and SOPs as well as control distribution.
- Conduct training in QA/QC functions and coordinate training program documentation.
- Coordinate laboratory participation in proficiency testing programs and regulatory accreditation programs.
- Coordinate routine quality checks: monitoring reagent water and equipment (refrigerators, ovens, autoclaves, etc.), and annual calibrations of balances, thermometers, and weight sets.
- Monitor and close nonconformances.
- Generate control charts and monitor QC performance.
- Evaluate subcontractors and vendors that provide analytical and calibration services.
- Ensure that all operations comply with local, state, and federal regulations.

The ***Sample Receptionist*** reports directly to the Operations Manager. He/she is responsible for the sample receiving and log-in functions and documenting conditions compromising sample and data quality upon sample receipt.

Laboratory Technical Personnel (Analysts and Technicians) are responsible for the generation of data by analyzing samples according to method SOPs and client requirements. Responsibilities include:

- Understanding the requirements in QAM and the SOPs as required for their specific duties.
- Implementing the policies contained in this manual.
- Ensuring all steps related to sample preparation and analyses are documented completely and accurately.
- Performing initial review of sample data, calculations, and raw data with the authority to stop, accept or reject data based on compliance with laboratory QC criteria.
- Correcting and thoroughly documenting problems and deficiencies in the laboratory processes.
- Notifying the Laboratory Director of problems detected.
- Monitoring, calibrating, and maintaining laboratory equipment such as refrigerators, ovens, autoclaves, water systems, thermometers, and micropipettes, as required.

2.2 Personnel Qualifications and Training

MI management believes that the responsibility for a high-quality product starts with each employee. Having qualified and professional staff is the most important aspect in ensuring a high level of data quality service in the industry. Each employee is selected for a particular position based on his/her educational background and level of experience in a related field.

Personnel training begins with an orientation program designed to familiarize the new associate with safety issues, the importance of QA/QC in the laboratory, and company policies and benefits.

The level of training necessary to perform analytical tasks is determined from employee's academic background, past experience, technical courses, and on-the-job training with specific methods and/or instrumentation. Obtaining additional specialized skills through in-house training or external workshops is the responsibility of the individual and the Laboratory Director. Copies of certificates of completion, transcripts, diplomas, or other documentation are maintained in the personnel files as appropriate.

The Laboratory Directors are responsible for ensuring that laboratory employees working in their area receive proper training in test methods and laboratory procedures and for documenting any training received. Training records will be kept on file for each key employee; this includes on-the-job training records and certification of technical proficiency in microbiological testing.

New employees will undergo an orientation procedure within their first 30 days of employment. The basic training functions covered, as applicable, include:

- Use of general laboratory equipment (weighing, use of syringes, pipetting, etc.)
- Record keeping, data generation, and reporting
- Safety Practices and how to read MSDSs
- QA/QC requirements
- Instrument/equipment maintenance

Trainees are under the supervision of the Laboratory Director, who is responsible for showing them the testing procedures, including applicable QA/QC requirements. A new employee is not permitted to perform a test until the Laboratory Director is confident that the test and QA/QC procedures can be carried out correctly and demonstration of capability (DOC) is documented. The Laboratory Director or his/her designee conducts technical training to ensure method understanding. All new personnel are required to read the SOP and demonstrate competency in performing a particular method by successfully completing a DOC before conducting a test independently on client samples.

Analysts' competency will be demonstrated by (1) testing of in-house laboratory QC samples (if available), (2) analysis of external proficiency testing (PT) materials [e.g., AIHA Environmental Microbiology Proficiency Analytical Testing Program (AIHA EMPAT)], (3) certified reference materials (CRMs) (if available), or (4) through an observation by the Laboratory Director. If the test method does not specify accuracy and precision requirements, the results are compared to acceptance criteria set by the laboratory. A DOC record is created and maintained in the employee's training file.

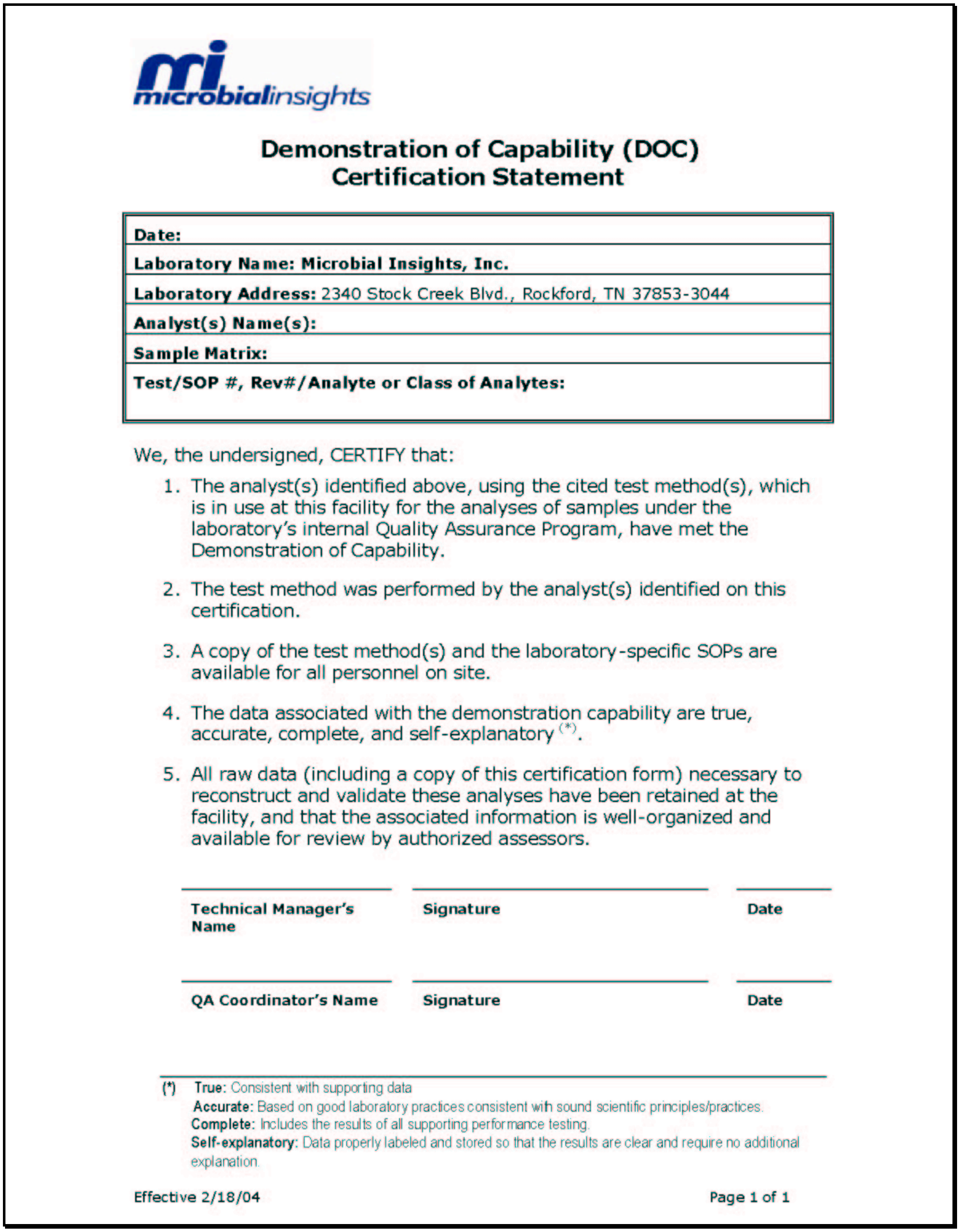
MI management has a responsibility to provide facilities, equipment, maintenance, and an organized program to make necessary improvements to ensure a safe working environment. The laboratory Safety and Health Management Program provides a complete discussion of the safety policies enforced by the laboratory.

2.2.1 On-Going Training and Retraining

MI has committed to ensuring that all analysts remain proficient in the tests they perform. Documentation of continued proficiency is recorded in each analyst's training file for each method that he/she performs. Retraining is only required for those individuals who demonstrate systematic performance problems. The Laboratory Director is responsible for determining the appropriate means to provide retraining for those individuals whose performance is questionable. Additionally, SOPs are reviewed annually and analysts are required to read the latest version of the SOP. This activity is documented as SOP training in the training files. Copies of all training documents are maintained in a secure file cabinet.

Managers, QA staff, supervisors, and other support staff are not required to undergo technical proficiency training since they are selected for these positions on the basis of experience, education, and background.

Figure 2. Demonstration of Capability (DOC) Record



microbialinsights

Demonstration of Capability (DOC) Certification Statement

Date:

Laboratory Name: Microbial Insights, Inc.

Laboratory Address: 2340 Stock Creek Blvd., Rockford, TN 37853-3044

Analyst(s) Name(s):

Sample Matrix:

Test/SOP #, Rev#/Analyte or Class of Analytes:

We, the undersigned, CERTIFY that:

1. The analyst(s) identified above, using the cited test method(s), which is in use at this facility for the analyses of samples under the laboratory's internal Quality Assurance Program, have met the Demonstration of Capability.
2. The test method was performed by the analyst(s) identified on this certification.
3. A copy of the test method(s) and the laboratory-specific SOPs are available for all personnel on site.
4. The data associated with the demonstration capability are true, accurate, complete, and self-explanatory (*).
5. All raw data (including a copy of this certification form) necessary to reconstruct and validate these analyses have been retained at the facility, and that the associated information is well-organized and available for review by authorized assessors.

Technical Manager's Name	**Signature**	**Date**
QA Coordinator's Name	**Signature**	**Date**

(*) **True:** Consistent with supporting data
Accurate: Based on good laboratory practices consistent with sound scientific principles/practices.
Complete: Includes the results of all supporting performance testing.
Self-explanatory: Data properly labeled and stored so that the results are clear and require no additional explanation.

Effective 2/18/04

Page 1 of 1

3 Description of Facility and Laboratory Instrumentation

MI's facility, located south of Knoxville, Tennessee in the Technology Corridor, occupies a 10,000 square foot, state-of-the-art laboratory. MI facilities include molecular, analytical, and culturing divisions to provide complete, cost-effective, and reliable data. Figure 3 depicts the laboratory floor plan.

MI's facility is designed for efficient, automated, high-quality operations. MI's laboratory is equipped with Heating, Ventilation, and Air Conditioning (HVAC) systems appropriate to the needs of microbiological testing laboratories. Environmental conditions in the facilities, such as hood flow, are routinely monitored and documented. The laboratory space has been designed to reduce potential sources of cross contamination through segregation of functional areas. Laboratory areas are considered secured areas and restricted to authorized personnel only.

MI's facility is equipped with safety features. Each employee is familiar with the location, use, and capabilities of general and specialized safety features associated with their workplace. To minimize potential exposure to chemicals, MI has designated a lunch/break area that is separate from the testing areas. MI also provides and requires, when applicable, the use of certain items of protective equipment including safety glasses, protective clothing, gloves, etc.

3.1 Laboratory Instrumentation and Equipment

MI maintains the latest instrumentation and equipment required for analyzing microbiological samples. Only authorized, trained individuals are allowed to operate analytical equipment. As described in Section 2.2, the instrument competency is documented using DOCs (Figure 2) and maintained in training files.

The Laboratory Director or designee monitors sample capacity on a daily basis to ensure that adequate resources are available to complete analyses and to report data within client-specified timelines.

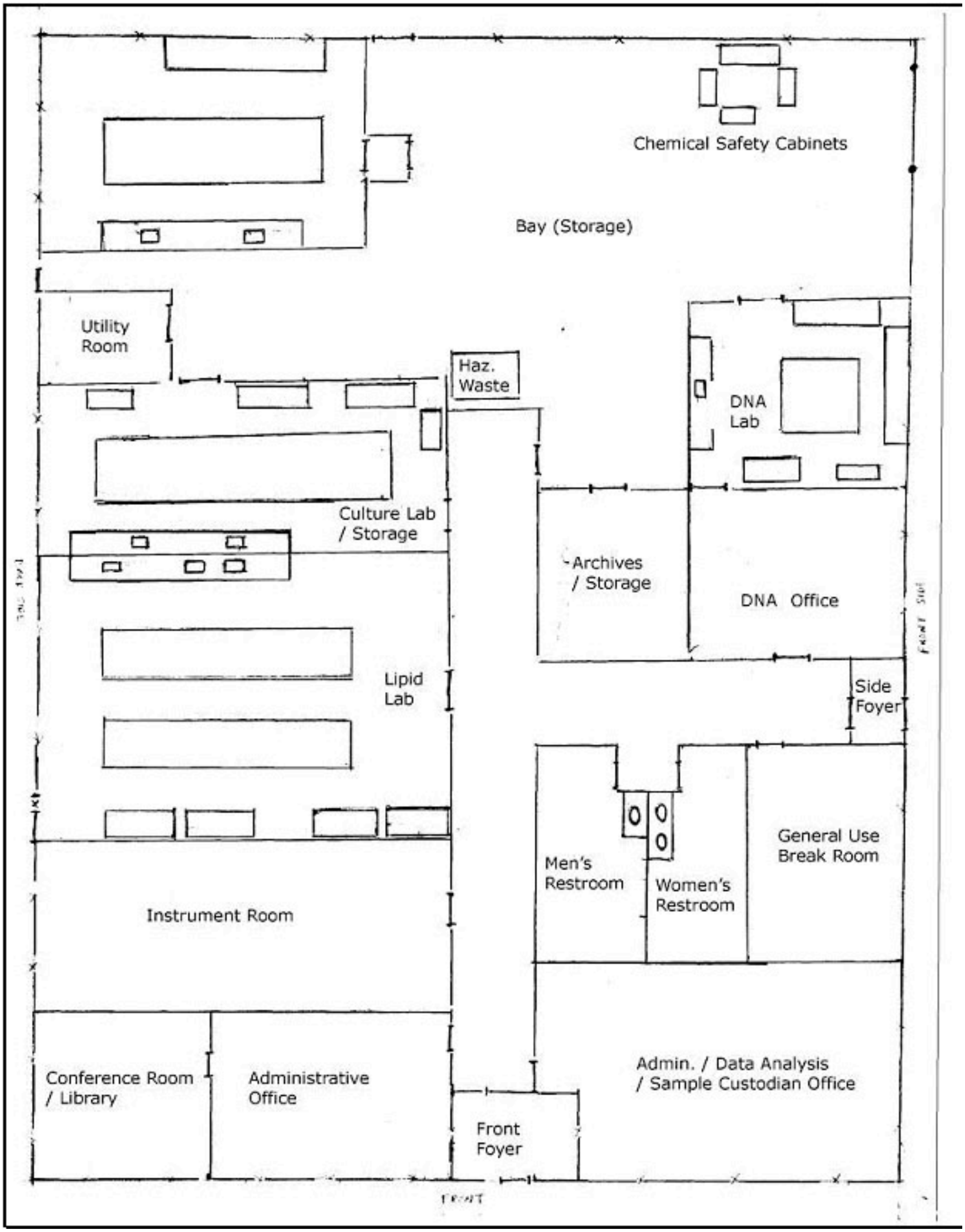
3.2 Equipment Calibration and Maintenance Procedures

To ensure safe handling and maintenance, each major analytical instrument is labeled as to calibration status, including the date of last calibration and date when recalibration is due, as appropriate.

MI employs a system of preventive maintenance to ensure system up time and data validity, and to minimize maintenance costs. All routine maintenance is performed as recommended by the manufacturer and performed by a laboratory analyst or by an outside technician. Maintenance logbooks documenting routine maintenance and repairs are kept on all major analytical equipment. Notation of the date and maintenance activity is recorded each time service procedures are performed. Routine maintenance schedules are documented in method-specific SOPs.

For equipment that goes outside the control of the laboratory, "return to laboratory control" is established following instrument calibration and/or repair and is documented in the maintenance logbook. Return to control can be accomplished by successful analysis of proficiency or positive and negative control samples.

Figure 3. Laboratory Floor Plan



For each instrument, the maintenance logbook will be identified by including a unique identifier for the equipment (e.g., serial number), manufacturer's name/model and location of equipment. Maintenance logbooks are maintained as QC records. A manufacturer's operating manual or equivalent that defines the operating conditions and use of equipment will also be available near where the test is performed.

Outside vendors may be used for equipment maintenance which cannot be performed internally. In this case, calibration will be done according to laboratory QA policies and SOPs in order to demonstrate competence, measurement capability, and traceability of measurement.

Procedures for calibrating laboratory instruments and equipment, thermometers, weight sets, and for the ongoing monitoring of balances, water baths, ovens, autoclaves, refrigerators, freezers, and reagent-grade water are outlined in laboratory SOPs. These devices may not be the actual test instrument, but are necessary to support laboratory operations.

All maintenance operations, internally and externally, are documented with the name of the person performing maintenance, the date, and details of maintenance, including measured values out of tolerance.

3.3 Equipment Tag-Out Procedure

If any item undergoing maintenance or calibration is unable to perform its function within tolerance values established for the laboratory equipment specified, it will be taken out of service. The item will also be removed from the laboratory and will be placed in storage or disposed of. The Laboratory Director is responsible for investigating if the defect has affected any reported results to clients and will identify the appropriate corrective action to be implemented. If necessary, the client will be notified and a revised report will be submitted.

3.4 Computer Software Validation (Data Integrity and Security)

Access to computer systems that collect, analyze, and process raw instrumental data, and those that manage and report data is both controlled and recorded. Computer security is controlled by a User Name/Password system. Security access to the system is restricted to only those staff members allowed to add, modify, and change data. Entries and changes are documented with the identity of the individual making the entry, and the time and date.

All internally developed computer software related to data generation activities is evaluated by the developer and by an independent person (Laboratory Director or a qualified designee) to ensure that computer-generated data are accurate and meet the end users' specific requirements.

The laboratory maintains copies of outdated versions of software and associated manuals for all software in use at the laboratory for a period of five years from its retirement date.

4 Document Control and Control of Records

The following documents, at a minimum, are controlled at MI:

- Quality Assurance Manual
- Standard Operating Procedures
- In-house generated data reporting forms

4.1 Document Control Procedure

To ensure that confidential information is not distributed and that all current copies of a given document are from the latest applicable revision, documents must be maintained in a controlled and secure manner. Identification of a controlled document includes the following items in the document header: Document Name, Document or SOP Number, Revision Number, Revision Date, Effective Date, and Number of Pages. The Laboratory Director and/or designee authorize controlled documents. Controlled documents are marked as such and records of their distribution are kept in the QA files.

4.2 Document Revision

At times, changes in SOPs are required as a result of new instrumentation, QC criteria, methods, client requirements, or improved procedures. On an annual basis, SOPs are reviewed to assess if the SOP reflects current operations and are approved by the same management team. Any change in an SOP requires the approval of the Operations Manager.

As approved revisions to controlled documents are prepared and distributed, outdated versions are removed from the laboratory and destroyed. The original copy of each revision is archived in the QA files for reference purposes. All documents distributed internally are controlled in this manner. Documents distributed externally (to clients, etc.) are controlled on a case-by-case basis.

SOPs are also controlled via electronic files, which are located in the QA folder on the server. Only the latest revision of the SOP is made available to the laboratory employees in a “read only” format so that no changes can be made inadvertently. Laboratory-generated forms are controlled through the “Effective Date” placed on the bottom of each form. Only the most current versions of the forms will be used throughout the laboratory.

Content requirements of SOPs are described in detail in Section 9.1.

4.3 Data Recording

All recording of data shall be done electronically in the LIMS (Laboratory Information Management System) or directly on preprinted forms or bound logbooks designed for the record keeping purpose at the time of data generation. Bound logbooks (i.e., permanent, spiral, or three-ring) will be used for documenting instrument operations (e.g., analysis and maintenance). Pages inserted into three-ring notebooks must be sequentially numbered as they are added to the notebook. LIMS-generated or electronic forms may be used in place of bound logbooks for documenting laboratory operations.

Computer printouts, certification information, or other printed records may be inserted into the logbooks, provided that data are not covered. The analyst shall sign over the item inserted, the tape, and the logbook page so that it can be determined if something has been removed.

All manually recorded data entries and corrections in laboratory logbooks and worksheets must be recorded in permanent ink. Each entry must be legible, dark and clear enough for photocopying. All data corrections on written or printed forms must be made using a single line cross out of the error, made in such a manner that the original entry may still be read. Each correction must be dated and initialed by the person making the change. If there are multiple changes being made by the same individual on a data sheet, a single initial and date on each page is sufficient. Liquid correction fluid, correction tape, or other blocking material or obliterating techniques must never be used on any original laboratory data records. (Note: It may be necessary for such an obliteration technique to be used to protect client confidentiality information on copies of laboratory records.)

4.4 Client Confidentiality and Proprietary Rights

It is MI's policy to preserve the confidentiality of data and reports generated by the laboratory and to respectfully decline the release of this information to individuals other than authorized representatives of the clients. MI's reports, and the data and information provided therein, are for the exclusive use and benefit of the client, and are not released to a third party without written consent from the client.

If directed by courts-of-law or other authorities, such as regulatory agencies, MI management will provide records as necessary and notify clients regarding the identification of the requester and the records that were requested.

4.5 Data Archives

Data archives are protected against fire, theft, loss, deterioration, and vermin. Electronic records are protected from deterioration caused by magnetic fields and/or electronic deterioration. Access to archives is controlled. MI ensures that all records are maintained as required by the regulatory guidelines and per the QAM upon facility location change or ownership transfer.

4.6 Record Retention

All records of chemical analyses, including all raw data, calculations, logbooks, quality control data, and reports are kept at the laboratory for a minimum of five years unless otherwise specified by the customer.

5 Control of Purchased Items and Services

The procurement of equipment, instruments, chemicals, standards, and services is controlled to ensure compliance with specified requirements. The Laboratory Director or designee ensures the adequacy and quality of all contractor-purchased items and services.

MI maintains a documented receiving inspection system, which ensures:

- Procured items and services indicate evidence of inspections and tests performed by the supplier in accordance with purchasing requirements and are accompanied by required certifications (if available).
- Chemical analyses and physical tests are performed in accordance with the approved analytical protocols (if applicable).

When an item, material, or service procured does not conform to applicable specifications, it is identified as nonconforming, segregated to the extent practical, and held for possible corrective action.

5.1 Selection and Qualification of Subcontractor Laboratories

MI does not routinely subcontract analytical services with the exception of certain chemical analyses of organic and inorganic substances. Subcontracting is arranged according to the needs of the client. Samples are subcontracted under a formal chain-of-custody (COC) procedure and in compliance with subcontractors' instructions.

5.2 Purchasing Services, Consumables and Supplies

Evaluation and selection of suppliers and vendors is done on the basis of their references, certifications, QA documentation, overall quality of their services, previous experience with the vendor, and competitive pricing. This is achieved through evaluation of objective evidence of quality furnished by the supplier, which can include certificates of analysis, recommendations, and proof of historical compliance with similar programs for other clients. To ensure that quality critical consumables and equipment conform to specified requirements, the Laboratory Director or his designee approves all purchases from specific vendors.

Chemical reagents, solvents, and gases are available from a variety of sources and in a variety of purity grades. In general, if the method does not specify the grade required, "analytical grade" will be purchased. The receipt of any item critical to the analysis, such as an instrument or reagent, is documented. This includes model/type, condition/age, and acceptance status of the item. Reagents are dated upon receipt and upon opening to establish their order of use and to minimize the possibility of exceeding their shelf life.

6 Chain-of-Custody, Sample Receiving and Sample Handling Procedures

6.1 Internal Chain-of-Custody

The chain-of-custody (COC) procedures are applicable to all samples received by MI or its subcontractors, regardless of sample origin or disposition. COC is established either when sample containers are sent to the field (if requested), or at the time of sampling. MI can provide all of the necessary containers, COC forms, or packing materials required to properly pack and ship samples to the laboratory. Figure 4 illustrates an example Chain-of-Custody Form.

Samples are received at the laboratory by a designated receiving person and entered in the Laboratory Information Management System (LIMS), which automatically assigns a unique Laboratory Project Identification Number. LIMS facilitates the tracking of client samples by automatically assigning unique project and sample numbers to all client samples, storing information pertinent to each of those samples (e.g., the client sample name, description and/or location, the number and type of sample containers, the sample matrix and volume, etc.), and providing a mechanism whereby analytical requests may be saved and communicated to laboratory personnel.

A LIMS-generated sample log or equivalent, listing all client samples in each sample shipment, will include: client/project name, client sample identifications, date/time of laboratory receipt, unique laboratory project number identifying the group of samples received, unique sample IDs, condition of samples at time of receipt (Section 6.2), and signature or initials of the person receiving the samples and making the entries. The Sample Receiving Person has the primary responsibility for (1) receiving and opening all packages, (2) immediately examining samples for damage or condition, (3) reviewing to ensure agreement between the test samples received and the COC form and (4) accurately logging samples into LIMS.

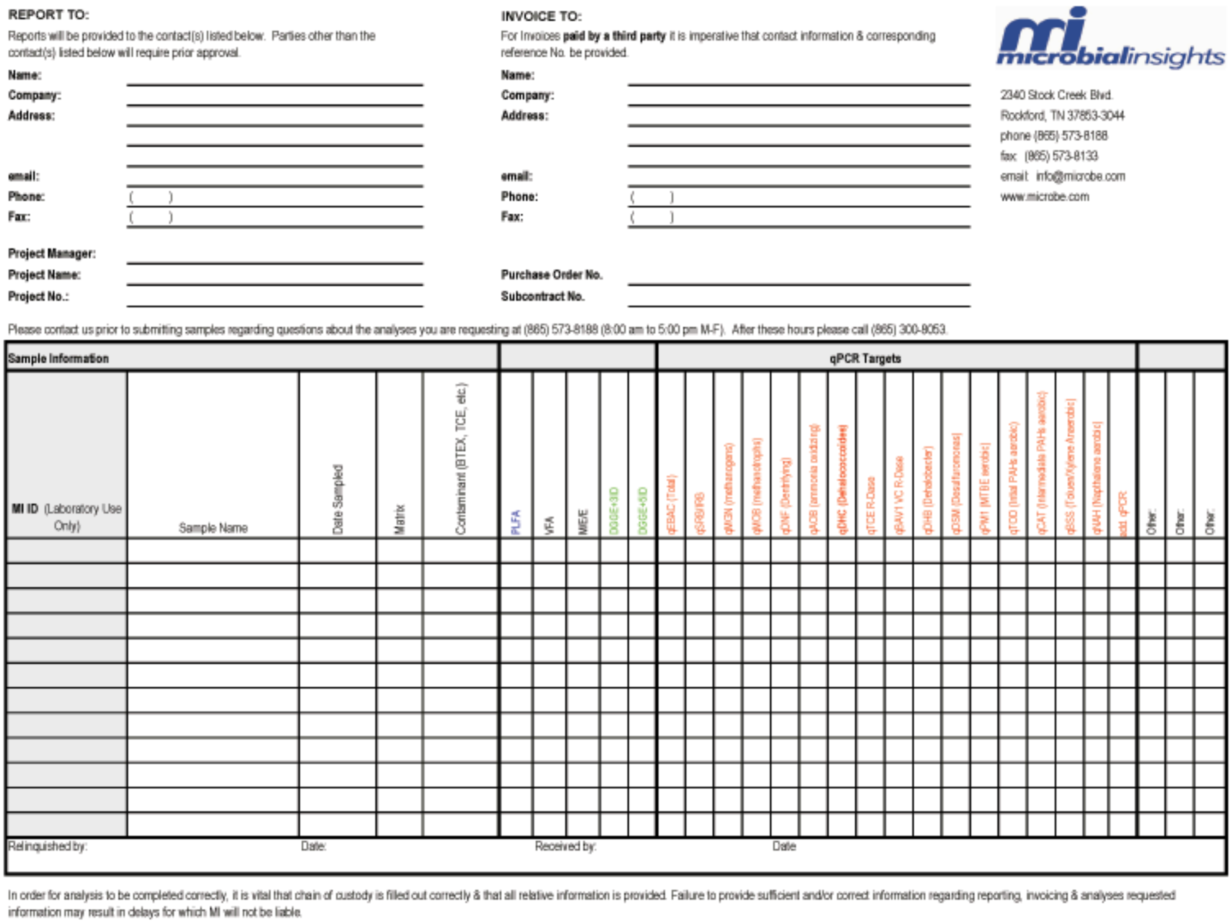
A Sample Reception Checklist is used to document Sample Receiving Person’s review of the COC form and the samples received. This individual also completes the Project/Client Information Sheet documenting client/project-specific requirements and attaches it to the project folder, which is then routed to the specific division for sample processing.

6.2 Sample Acceptance Policy

Samples are considered “compromised” if the following conditions are observed upon sample receipt:
- Samples are received broken or leaking.
- Samples are received beyond holding time (if applicable).
- Samples are received without appropriate preservative (if applicable).
- Samples are received in inappropriate containers.
- COC information does not match samples received.
- COC is not properly completed or not received.
- Breakage of any custody seals (if applicable).
- Inadequate sample volume.
- Illegible, impermanent, or non-unique sample labeling and identification.

When “compromised” samples are received, it is documented in a Sample Receiving Form or on a Corrective Action Form and the client is contacted by phone or e-mail for instructions. If the client decides to proceed with analysis, the report comment section will clearly indicate any of the above conditions and the resolution. Any nonconformance, irregularity, or compromised sample is documented and brought to the immediate attention of the Laboratory Director for resolution with the client and documented. The COC form, shipping documents, documentation of any nonconformance, irregularity, or compromised sample receipt, record of client contact, and resulting instructions become part of the permanent project record.

Figure 4. MI Chain-of-Custody Form



REPORT TO:

Reports will be provided to the contact(s) listed below. Parties other than the contact(s) listed below will require prior approval.

Name:
Company:
Address:
email:
Phone: (   )
Fax: (   )

Project Manager:
Project Name:
Project No.:

INVOICE TO:

For Invoices **paid by a third party** it is imperative that contact information & corresponding reference No. be provided.

Name:
Company:
Address:
email:
Phone: (   )
Fax: (   )

Purchase Order No.
Subcontract No.

2340 Stock Creek Blvd.
Rockford, TN 37853-3044
phone (865) 573-8188
fax: (865) 573-8133
email: info@microbe.com
www.microbe.com

Please contact us prior to submitting samples regarding questions about the analyses you are requesting at (865) 573-8188 (8:00 am to 5:00 pm M-F). After these hours please call (865) 300-8053.

Sample Information										**qPCR Targets**																			
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Matrix	Contaminant (BTEX, TCE, etc.)	PLFA	VFA	ME/E	DGGE+3D	DGGE+5D	qEBAC (Total)	qSRB/IRB	qMGN (methanogens)	qMOB (methanotrophs)	qDNF (Denitrifying)	qAOB (ammonia oxidizing)	qDHC (Dehalococcoides)	qTCE R-Dase	qBAV1 VC R-Dase	qDHB (Dehalobacter)	qDSM (Desulfuromonas)	qPM1 (MTBE aerobic)	qTOD (Initial PAHs aerobic)	qCAT (Intermediate PAHs aerobic)	qBSS (Toluene/Xylene Anaerobic)	qNAH (Napthalene aerobic)	add. qPCR	Other:	Other:	Other:
Relinquished by:		Date:					Received by:						Date																

In order for analysis to be completed correctly, it is vital that chain of custody is filled out correctly & that all relative information is provided. Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

6.3 Sample Identification and Traceability

Each sample container is assigned a unique sample identification number that is cross-referenced to the client identification number to allow traceability of test samples and unambiguous documentation. Each sample container is either affixed with a sample identification label or includes a hand written sample identification.

Upon client request, where possible, access to all legal samples and subsamples will be controlled and documented. Laboratory area is considered a secured area and restricted to authorized personnel only.

6.4 Sample Preparation

Where applicable, holding times for every analysis are established in the method SOPs or on a project-specific basis. Work is scheduled by the Laboratory Director to avoid expiration of any sample prior to analysis.

Samples are prepared according to standardized methods. Batches are generated in the prep lab according to preparation method, analytical method, and matrix. In general, batches do not exceed 20 field samples of the same matrix and are defined as samples prepared at the same time.

Repreparation or reanalysis of a sample may be required in cases of contamination, missed dilution, low control sample recovery, etc. Repreparation may be identified as a result of the primary or second level data reviews by the analyst and/or the Laboratory Director.

6.5 Sample Storage, Transfer, Retention and Disposal Policy

All samples are stored in secure laboratory areas that meet the standard storage and preservation criteria for the type of sample and requested analysis. Samples are maintained in refrigerators if required by the particular method. Samples and standards are maintained separately to prevent cross contamination. Unless specified by method or state regulation, a tolerance range of 4 ± 2 ^{o}C is used. Sample storage temperatures are monitored daily. Once the samples are checked out from the sample receiving area, log books are used to track and document the internal custody of all client samples. Any movement of samples within the laboratory is recorded in the log books.

It is MI policy to dispose of samples 60 days after the data report is delivered to the client unless prior written arrangements have been made with the client. In some cases, such as plated samples, the plates must be disposed of before the 60-day period. Any such samples are generally disposed of within one week of analysis in order to prevent any possible laboratory contamination resulting from overgrowth.

If longer storage is requested by the client, MI can accommodate the request. Final disposition of client samples will be documented in a bound logbook or in LIMS.

Samples are disposed of in accordance with federal, state and local regulations. Unused portions of samples found or suspected to be hazardous according to state or federal guidelines may be returned to the client upon completion of the analytical work.

6.6 Sampling Materials and Procedures

MI does not perform field sampling activities; however MI provides its clients with procedures for collecting samples. MI can provide all of the necessary sample containers, COC forms, preservatives (if applicable), or packing materials required to properly pack and ship samples to the laboratory.

If specified by a published method, MI will request that the client submit field blanks with their samples.

7 Control of Nonconformances and Corrective Actions and Preventative Actions

7.1 Identification and Correction of Nonconformances

Nonconformances include any out-of-control occurrences relating to client requirements, procedural requirements, or equipment issues. A nonconformance is typically defined as an unplanned deviation from an established protocol. In some instances, a nonconformance may be the result of MI's actions, or the result of events beyond MI's control. All nonconformances are documented at the time of their occurrence using the system described in this section.

When appropriate, reanalysis is performed where QC data fall outside of specifications, or where data appears anomalous. If the reanalysis result falls within established QC criteria, the results are approved. If the reanalysis is still outside acceptance criteria, further reanalysis or consultation with the Client, Laboratory Director for direction may be required. All records of reanalysis are kept with the original project files.

Deviations from this QAM or SOPs, deficiencies, errors, or out-of-control situations require corrective action. All nonconformances that affect a sample and/or sample data are documented in project folder.

Any employee who detects the need for corrective action is responsible for and is authorized to initiate a corrective action. When a problem requiring corrective action is identified, the following items are listed by the initiator: the nature and description of the problem, project and sample identifications (if applicable), the name of the initiator, and the date.

An essential part of the corrective action process is to identify systematic errors, or errors that are likely to occur repetitively due to a defect or weakness in a system. The initiator and affected employee(s) and/or division(s) examine potential actions that will remedy the present problem to the extent possible, and prevent recurrence in the future. If the initiator is uncertain as to what would constitute appropriate corrective action or is unable to resolve the situation, the problem is referred to the Laboratory Director.

The root cause of the problem, implementation of the corrective action, and the date of implementation are documented in the Corrective Action Form (CAF). All CAFs are reviewed and tracked by the Laboratory Director or designee.

Where nonconformances specifically affect a client's sample and/or data, the client is informed and action must be taken. Action may involve reporting and flagging the data, and including the nonconformance in the comments section of the report comments section.

7.2 Segregation

When practical, nonconforming items will be segregated from conforming items by placing them in a clearly marked area until appropriate corrective action is taken or until disposition.

7.3 Preventative Action

Preventative action is defined as noting and correcting a potential problem before it happens. Preventative action includes analysis of the Quality System to detect, analyze, and eliminate potential causes of nonconformances. When potential problems are identified, preventative action is initiated to address the problem to eliminate or reduce the risk identified. The preventative action process takes the same format as the corrective action process.

In order to prevent system down time, minimize corrective maintenance costs and ensure data validity, the laboratory employs a system of preventive maintenance. General preventive maintenance procedures are outlined in each instrument's operation manual. All routine maintenance is performed as recommended by the manufacturer. The manuals also assist in the identification of commonly needed replacement parts, so that an inventory of these parts can be maintained at the laboratory. It is the Laboratory Director's responsibility to make sure that the most current version of the operator manual is available in the laboratory. Routine maintenance is performed by the analyst while an external vendor may be called in for major repairs.

A bound maintenance log notebook is kept with each instrument to record all routine and non-routine maintenance. Notation of the date and maintenance activity is recorded every time service procedures are performed. This includes routine service checks by laboratory personnel as well as factory service calls (as required). The return-to-control following instrument repair is also noted in laboratory maintenance logbooks.

7.4 Client Communications & Handling of Client Inquiries and Complaints

Client inquiries are generally received through the laboratory management. The management communicates with the client to ascertain the details of the inquiry or complaint, including data problems, deliverable issues, turn-around-time, etc. The Laboratory Director may assign a specific person to investigate and identify a resolution for the complaint. In cases where a client complaint indicates that an established policy or procedure was not followed, the Operations Manager is required to conduct a special review to assist in resolving the issue. A written confirmation or letter to the client, outlining the issue and response taken is strongly recommended as part of the overall action taken.

8 Performance Audits

Performance evaluations are essential in every QA program. These audits are used to determine on-going compliance with the QA program and client specifications and to assess the overall quality of data generated during the measurement process.

8.1 Management Reviews

Each year, the Laboratory Director or his/her designee reviews the QA program to ensure the continued effectiveness of the laboratory's quality system and to introduce any necessary changes or improvements. The following key elements of the QA Program are reviewed during this assessment:

- Client complaints and communications
- Systematic, significant nonconformances, corrective and preventive actions
- Results of external on-site audits conducted by accrediting bodies, regulatory agencies, or clients
- Results of Internal audit findings
- Results of proficiency tests and inter-laboratory comparisons
- Changes in the volume or type of testing / workload fluctuations
- Staffing resources and training needs
- Training requirements

8.2 Monthly Internal Audits

Monthly audits are conducted by the Laboratory Director or his/her designee to ensure that the mandates provided in the laboratory QA Manual are being followed.

9 Analytical Test Methods

The majority of the test methods performed at MI are laboratory-developed proprietary methods. However, MI adheres to the following reference methods, where applicable:

- Standard Methods for the Examination of Water and Wastewater, 18th, 19th and 20th edition, 1995 and 1998.
- Annual Book of ASTM Standards, American Society for Testing & Materials (ASTM), Philadelphia, PA
- The Manual of Environmental Microbiology, ASM, 1996.
- Bergey's Manual of Determinative Bacteriology.
- Bergey's Manual of Systematic Bacteriology.
- Standard Practice for Preservation by Freezing, Freeze-Drying, and Low Temperature Maintenance of Bacteria, Fungi, Protista, Viruses, Genetic Elements, and Animal and Plant Tissues, ASTM E1342-97.

9.1 Standard Operating Procedures

To ensure and document that each operational system and analytical procedure is performed in a uniform, standard manner, MI has developed a series of SOPs. MI maintains an index listing all standard and laboratory-developed methods. Method SOPs are maintained to describe a specific test procedure. Procedural SOPs are maintained to describe general administrative procedures not related to a specific test method. A list of current, active SOPs in use at MI is available upon request.

A typical SOP contains the following information as applicable:
- Header Information - *Title Page with Document Name, Document Number, Revision Number, Effective Date, Page Numbers and Total # of Pages, Proprietary Statement, Approval Signatures, and Approval Dates.*
- Scope and Application
- Interferences
- Safety
- Equipment and Supplies
- Reagents and Standards
- Sample Collection, Preservation, and Storage (if applicable)
- Calibration
- Quality Control
- Procedure
- Data Analysis and Calculations
- Waste Management and Pollution Prevention
- References
- Miscellaneous (Appendices, Tables, Diagrams, Flowcharts, etc.)

Each SOP is reviewed, approved, and signed by the Laboratory Director, and Operations Manager. The Operations Manager or his/her designee is responsible for maintenance of SOPs, archival of SOP historical revisions, and maintenance of a current SOP index. SOPs, at a minimum, undergo annual review.

In some cases, a standard laboratory procedure may be modified slightly to accommodate instrument conditions or to minimize waste. Occasionally situations may arise in which a deviation from the SOP is necessary. This is permissible as long as the Laboratory Director is notified and a Corrective Action Form filled out. Deviations will be recorded in the project folder.

Method Validation

Before analyzing samples, a validation of the method is required for laboratory-developed methods involving quantitation determinations. The following activities are generally required as part of method validation. Method validation records are designated QC records and are archived accordingly.

9.1.1 Determination of Method Sensitivity

Method sensitivity is determined using detection limit studies. The Method Detection Limit (MDL) is the approximate limit at which an analyte can be qualitatively detected using a specific method at a 99% confidence interval. The MDL is a statistically calculated value and measures the sensitivity of an entire method and is independent of device. MDL studies are performed using the criteria in 40 CFR Part 136 Appendix B and are described in policy *Determination of Method Detection Limits*. MDLs are only required for quantitative chemical analyses and are not applicable to qualitative determinations, such as the identification of a genus or species of mold or bacteria, since there is no physical measurement involved.

The Reporting Limit (RL) or Limit of Quantitation is the limit at which an analyte can be qualitatively detected and quantified at a 99% confidence interval. The RLs are also set based on specific knowledge about the analyte, project specific requirements and/or regulatory requirements. The RL is always greater than the MDL and is typically set based on 2-10 times the MDL.

MI reports results to the sample-specific RLs. Sample specific RLs are derived by taking into account various sample specific data, which can include the amount of the sample subject to testing, percent moisture, dilution factors, interferences, and the base RLs for the analysis.

At MI, measurements below the laboratory reporting limits are reported as "<" or not detected (ND) with a reference to the RL.

9.1.2 Determination of Method Accuracy and Precision

Accuracy and precision studies are generally performed using replicate control sample (LCSs or positive controls) analyses, with a resulting percent recovery and measure of reproducibility (standard deviation, relative standard deviation) calculated and measured against laboratory-established acceptance criteria. Duplicate analyses on separate aliquots of samples are used to evaluate method variance.

9.1.3 Determination of Range

Where appropriate, a determination of the applicable range of the method is performed. In most cases, range is determined and demonstrated by comparison of the response of an analyte in a curve to established or targeted criteria. The curve is used to establish the range of quantitation and the lower and upper values of the curve represent upper and lower quantitation limits. Curves are not limited to linear relationships.

10 Data Reduction, Validation and Reporting

Data validation is the process in which data are assessed for acceptability based on laboratory-established criteria. MI assesses and documents technical data quality to help the client evaluate the usability of data and make sound decisions. To ensure the identification and correction of potential anomalies early in the data generation process, all test data undergo a thorough review process as described below. All levels of the review are documented using the checklist.

10.1 Primary Review

The primary review is a “bench-level” review. In most cases, the analyst who generates the data (i.e. prepares and/or analyzes the samples) is the primary reviewer. In some cases, an analyst may be reducing data for samples to be analyzed by a different analyst. In this case, the identity of both the analyst and the primary reviewer is identified in the LIMS.

One of the most important aspects of primary review is to make sure that the test instructions are clear, and that all project-specific requirements have been understood and followed. If directions to the analyst are not clear, the analyst must go to the Laboratory Director who must clarify the instructions.

The primary reviewer ensures that:

- Sample preparation information is complete, accurate, and documented.
- Calculations have been performed correctly.
- Quantitative and qualitative identifications have been performed accurately.
- Data qualifiers have been applied correctly.
- Project-specific requirements have been followed.
- Method SOPs have been followed.
- QC criteria have been met.
- Nonconformances have been properly documented and appropriately communicated.

Primary review is documented using the LIMS. Any nonconformances noted during the primary review are communicated to the Laboratory Director. Resolution may require sample redeterminations, or it may require that data be reported with a qualification. Revisions are corrected by drawing a single line through the error and entering the correction alongside. The correction is then initialed and dated by the person who edited the data.

10.2 Second Level Laboratory Directory or Peer Review

The secondary review is a technical review of data and review of a project report, which outlines nonconformances identified during the primary and secondary reviews. The secondary review is documented and it is generally performed by the Laboratory Director or a designee. The review ensures the accuracy of final reporting and addresses the following items:

- Qualitative identification
- Calculations
- QC Samples and criteria (if applicable)
- Adherence to method SOPs
- Completeness

- Adherence to project-specific instructions
- Are QC failures approved and appropriately explained in the narrative notes or cover letter?

If problems are found during the secondary review, the reviewer must work with the appropriate personnel to resolve them. If changes are made to the data, the secondary reviewer must inform the analyst so that the primary reviewer is aware of the appropriate reporting procedures.

10.3 Laboratory Reports

MI can provide various types of data reporting based on a project's needs. MI can produce data packages as simple as an analytical report with results only, to more complex data packages that include a report narrative, analytical results, QC data, and supportive documentation including all raw data and chain-of-custody documentation. All laboratory reports include the following:

- Report title
- Laboratory name, address, telephone number, contact person
- Unique laboratory project number (assigned by LIMS)
- Page number on each report page and a total number of pages
- Name and address of client
- Client project name (if applicable)
- Client sample identification
- Sample matrix
- Dates of Sample Receipt, Collection, and Analysis
- Reporting units
- Test method and laboratory reporting limits (RLs)
- Where relevant, a statement to the effect that *the results relate only to the items tested*.
- Where relevant, a statement to the effect that *the test reports shall not be reproduced, except in full, without written approval of the laboratory*.

As required for the interpretation of the test results, a laboratory report will include the following:

- Environmental conditions.
- Compliance/noncompliance with client or regulatory requirements and/or specifications.
- Estimate of uncertainty of measurement.
- Opinions and interpretations.
- Additional information required by the client.
- Location of sampling.
- Standard or other specification for the sampling method or procedure, and deviations, additions to or exclusions from the specification concerned.
- Indication by flagging where results are reported below the laboratory reporting limits (RLs).

10.4 Report Release

The data analyst and reviewer authorize the release of the project report with a signature.

Where amendments to project reports are required after submittal, these shall be in the form of a separate document and/or electronic data deliverable (EDD). The revised report shall be clearly labeled as "Supplement to Test Report or Amended" with the date of revision and contain a reference to the original report that it replaces. Specific pages of a project report may be revised using the above procedure with an accompanying cover letter indicating the page numbers of the project revised. The original version of the project report must be kept intact and the revisions and cover letter included in the project files.

10.5 Electronic Data Deliverables

MI can provide EDDs in many standard formats or any custom format that our clients may require. Customized EDD formats can be generated automatically from analytical data imported from our LIMS into MS-Access programs that are built to the customer’s specifications for data types, field sizes, valid values, and file format. Once the EDD has been programmed and reviewed, Laboratory Director or reporting staff can easily generate project-specific EDDs in real time immediately following the completion of the analysis report. We can produce almost any file format including MS-Access, MS-Excel, delimited text, fixed width text and others. The resulting EDD file can be delivered to the client in diskette form, on CD-ROM, or via e-mail.

Internal Quality Control Procedures

10.6 Control Samples

Control samples are analyzed with each batch of samples to monitor laboratory performance in terms of method accuracy and precision. Each regulatory program (e.g., EPA, NIOSH, AIHA, etc.) and each published method within those programs specify the control samples that are prepared and/or analyzed with a specific batch. The frequency of control samples vary with specific regulatory, methodology, and project-specific criteria. The QC program implemented in the laboratory includes the analysis of method blanks (negative control), calibration check standards, LCS, and duplicate or replicate samples. Additional types of QC analyses are performed as necessary. The method SOPs provide a detailed description of the routine analytical QC activities.

10.7 Establishing QC Acceptance Limits

For new procedures, published method limits can be used until sufficient QC data are acquired. However, the published limits may not be appropriate if they are based on a single-operator or single-laboratory study. In this case, the QA staff may establish default limits until enough data are collected for laboratory established limits to be determined.

Laboratory established QC acceptance limits must be reevaluated at least annually. The control limits should be evaluated for systematic trends and consistency of the performance of the analytical procedure at least annually or whenever new patterns of performance are observed in the laboratory data (i.e. new methods, equipment, etc.).

10.8 Reporting QC Data

The QC data routinely reported may include a positive and negative controls (if applicable), laboratory blanks, and duplicates. Client reporting requirements are negotiated and documented as part of the project records.

10.9 Calibration

Calibration of instrumentation is required to ensure that the measurement system is operating correctly and functioning at the proper sensitivity to meet established reporting limits. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the calibration range established for the analytical method.

Method-specific SOPs discuss in detail how each instrument is calibrated, including frequency for calibration and recalibration, and the source or grade of the calibration materials. The range of analyses performed and instrumentation utilized is extensive and the calibration procedures are instrument specific, varying from analysis to analysis.

10.10 Measurement Traceability

Traceability of measurements is assured using a system of documentation, calibration, and analysis of reference standards. Laboratory equipment that is peripheral to analysis and whose calibration is not necessarily documented in a test method analysis or by analysis of a reference standard is subject to ongoing certifications of accuracy.

At a minimum, these include procedures for checking specifications for balances, thermometers, deionized (DI) and reverse osmosis (RO) water systems, automatic pipettes and other volumetric measuring devices. Wherever possible, general laboratory equipment is checked against standard equipment or standards that are traceable to national or international standards.

A certified outside support services vendor performs calibrations on laboratory balances on an annual basis, or as needed. This service is documented on each balance with a signed and dated certification sticker. Balances are calibrated internally on each day of use with a known NIST-traceable mass standard. All mercury thermometers are calibrated annually and digital thermometers are calibrated quarterly against a traceable reference thermometer. Temperature readings of ovens, autoclaves, refrigerators, and incubators are checked on each day of use. Pipettors are calibrated biannually and the certifications of accuracy recorded in the calibration log.

Laboratory DI water systems have documented preventative maintenance schedules and the conductivity (or resistivity) of the water is recorded on each day of use.

10.11 Reference Standards

The receipt of all reference standards is documented. Reference standards are labeled with a unique identification number, date received, and the expiration date. All documentation received with the reference standard is retained as a QC record and references the standard ID.
All standards should be purchased with an accompanying Certificate of Analysis that documents the standard purity. If a standard cannot be purchased from a vendor that supplies a Certificate of Analysis, the purity of the standard is documented by analysis. The documentation of standard purity is archived, and references the Standard Identification Number.

All efforts are made to purchase standards that are $\geq$ 97% purity.

10.12 Reagents

Reagents are, in general, required to be analytical reagent grade unless otherwise specific in method SOPs. Reagents must be at a minimum the purity required in the test method. The date of reagent receipt and the date the reagent was opened are documented.

10.13 Contract Acceptance Review

For many environmental sampling and analysis projects, testing requirements are site specific and do not necessarily fit into a standard laboratory service or product. It is MI’s intent to provide both standard and customized laboratory services to its clients. To ensure project success, the technical staff performs a thorough review of technical and QA/QC requirements contained in contracts. Contracts and Statements of Work (SOW) are reviewed for defined requirements and MI's capability to meet those requirements before a project is accepted and the work begins. Any discrepancy between the client's requirements and MI's capability to meet those requirements is resolved in writing by the Laboratory Director before acceptance of the contract.

11 References

The following references were used in the preparation of this document and as the basis of the MI Quality Program:

EPA Quality Manual for Environmental Programs, 5360, USEPA Office of Research and Development, National Center for Environmental Research and Quality Assurance, Quality Assurance Division, July 1998.

General Requirements for the Competence of Testing and Calibration Laboratories, ISO/IEC 17025: 1999.

Guidelines for Developing Quality Manuals. ISO/DIS 10013.

Guidelines for Uncertainty Estimation. AIHA Policies 2.7.10.7. Revision 0, November 28, 2001.

ISO/IEC 17025 Standard (section 5.4.6)

Appendix A

Terms and Definitions

Accuracy: the degree of agreement between an observed value and an accepted reference value.

Audit: a systematic evaluation to determine conformance to specifications of an operational function or activity.

Chain of Custody (COC): trail of accountability that ensures the physical security of samples, data, and records.

Compromised Sample: a sample received in a condition that jeopardizes the integrity of the results.

Controlled Document: a document for which the distribution is known. Updates of the document are sent to the original recipients, unless the copy distributed is an uncontrolled copy.

Corrective Action: measure taken to eliminate the causes of an existing non-conformance, defect or other undesirable situation in order to prevent recurrence.

Demonstration of Capability (DOC): procedure to establish the ability to generate acceptable accuracy and precision.

Document Control: ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

Holding Time: the maximum time that a sample may be held before preparation and/or analysis and still be considered valid as promulgated in the method.

Laboratory Blank: a blank matrix processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

Laboratory Control Sample (LCS): a blank matrix spiked with a known amount of analyte(s), processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

Laboratory Information Management System (LIMS): the laboratory's data management system.

Matrix: The substrate of a test sample.

Method Detection Limit (MDL): the minimum concentration of a substance (an analyte) that can be measured with 99% confidence that the analyte concentration is greater than zero and determined from analysis of sample in a given matrix containing the analyte. (40 CFR Part 136 Appendix B).

Nonconformance: an indication, judgment, or state of not having met the requirements of the relevant specifications, contract, or regulation.

Precision: the degree to which a set of observations or measurements of the same property, usually obtained under similar conditions, conform to themselves; a data quality indicator.

Proficiency Test (PT) Sample: a sample, the composition of which is unknown to the analyst, which is provided to test whether the analyst/laboratory can produce analytical results within specified performance limits.

Proprietary: belonging to a private person or company.

Quality Assurance (QA): an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

Quality Assessment: the overall system of activities enacted to ensure that the quality control activities are effective. It involves continuously evaluating the performance of the data, the production system, and the quality of the data produced.

Quality Control (QC): the overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users.

Quality Control Sample (QCS): an uncontaminated sample matrix spiked with a known amount(s) of an analyte(s) from a source independent from the calibration standards. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

Quality Assurance Manual (QAM): a document stating the quality policy, quality system and quality practices of the laboratory. The QAM may include by reference other documentation relating to the laboratory's quality system

Quality System: a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA/QC.

Raw Data: any original information from a measurement activity recorded in laboratory notebooks, worksheets, records, memoranda, notes, or exact copies thereof and that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic media, including dictated observations, and recorded data from automated instruments.

Record Retention: the systematic collection, indexing, and storing of documented information under secure conditions.

Standard Operating Procedure: a prescribed procedure to be followed.

Uncertainty: defined by ISO (International Vocabulary of Basic and General Terms in Metrology) as the parameter, associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurement.